

The Iron Age

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A New Form of Cupola Furnace.*

BY MR. JAMES RILEY.

The cupola furnace which I have to submit to the members of the Institute is the outcome of an earnest desire to shorten the duration of the operations necessary in making open-hearth steel. These operations may be divided as follows, taking, for illustration a charge for soft steel of 12 tons (say 9 tons of pig iron with 3 tons of steel scrap, and working with ore): Charging, one hour; melting, from three to four hours; boiling and finishing, six hours; repairing furnace, about half an hour. Looking at these operations with the view of reducing the cost, one naturally asks, "Can you not shorten the time occupied in charging, and reduce its cost in labor, by substituting machinery for manual labor?" I know that others besides myself have given a good deal of thought to this matter, but probably with the same result—that no contrivance yet hit upon for charging solid material is cheaper than manual labor. But, if our considerations turn in the direction of charging fluid metal, it will be at once apparent that this can be done in a very small fraction of the time now taken up, and with the very important advantage that we avoid the cooling down of the furnace due to the long operation and to the furnace-doors being open the while. By these means we should have a gain of nearly 10 per cent. of time—equal to one charge more a week—as well as a considerable saving in fuel and repairs. Arrived at this point it seems natural that we should look for an additional and a much greater saving than that just mentioned; for surely by charging fluid metal we must save three or four hours usually occupied in melting. Under this conviction, or with the view of determining whether this assumption was correct, Mr. Hackney, many years ago, tried at Landore the experiment of pre-melting the pig iron in a cupola, whence the fluid charge was readily and quickly transferred to the melting furnaces. He has somewhere published the result, which was an almost inappreciable reduction of the time usually taken up in working the solid charge. At the instance and to satisfy the directors of the Steel Co. of Scotland, immediately after I came to Glasgow I had two melting furnaces worked for a week with fluid charges obtained by pre-melting the pig iron in the foundry cupola. In estimating the result we concluded that there was a doubtful gain of a quarter of an hour per charge obtained at the expense of the coke and labor expended at the cupola. The explanation of the discrepancy between the expected and the actual result is known to many, but may nevertheless be briefly stated.

During the melting of a charge in an open-hearth furnace a large proportion of the silicon and carbon is removed, leaving little more than half the carbon to eliminate in the subsequent operations. Now, in the case of the fluid charge which has been pre-melted with coke in the cupola, these changes have not taken place, and the time required to remove the impurities from the fluid metal, after being charged in the open-hearth furnace, is almost as long as that required to melt and purify the solid charge. Long ago it occurred to me that, if I could substitute gaseous for solid fuel in melting in the cupola, I might be able to alter the conditions and accomplish the much-desired end. About 18 months ago I determined to try whether this could not be done, and accordingly got out designs for a cupola, which, however, seemed unsatisfactory in one or two parts. Some time later I discussed the matter with my friend Mr. Crossley, with the result that we modified the designs to pretty much what I now submit to you. The diagrams before you show two types of the cupola furnace, similar in principle, although differing in form. Figs. 1 to 3 show the fireplace or gas generator and the furnace body of a rectangular form in plan. In Figs. 4 to 6 the furnace is circular in plan, with a gas generator also of circular horizontal section. In both cases the gas generator has a closed grate and is dependent upon forced blast—obtained from an ordinary blower—for supporting combustion in the production of gas from the coal, which is charged in at the top in the customary manner. In like manner the air for supporting combustion in the body of the furnace is obtained from the blower, and in the case of No. 1 is passed through the pipes or nozzles placed transversely across the body of the furnace, almost directly over the bridge that divides the generator and furnace. These pipes are inclined so as to direct the flame down upon the bath of metal held in the hearth of the furnace. In this design the air for combustion is heated in the passages in the back wall of the generator, through which it is sent to the nozzles above referred to. In No. 2 the air for combustion passes twice around the hearth of the generator in the pipes shown in the figure, thence to the crown of the furnace body, whence, being thoroughly heated, it emerges by the air port directly over the gas port leading into the furnace and to the cupola, and, in addition, we can, if desired, turn this heated blast through the nozzles inserted in the sides of the furnace hearth, as shown. The cupola is of ordinary foundry type, of nearly equal dimensions from the bottom to the charging-hole, which is at about the

usual height from the hearth. It is in two parts, the lower being removable, and the upper supported on pillars, as shown. The hearth has a slight downward inclination to allow of the molten metal flowing readily into the furnace body. The hearth of the cupola is arranged so that it can be easily removed for repair and another substituted when necessary. This hearth-piece and the furnace body may be lined with either basic or acid material, as may be most suitable to the pig iron, &c., being melted and treated; for, besides melting, we are of opinion that, with a basic lining and necessary mixtures

and after about two hours' blowing we had the satisfaction of seeing the metal begin to melt and run down into the earth, whence it was shortly afterward tapped into the ordinary foundry ladle and run into castings. The experiment was continued long enough to indicate a few weak points in our apparatus, and also to remove some lingering doubts of the possibility of success. One or two more short trials having been made, I was anxious to make a more lengthened one—long enough, in fact, to furnish reliable data for action upon a large scale. Accordingly, we heated up the furnace on Monday,

At the earlier stages of the experiment, when melting pig iron alone, as much as possible was made into castings, which were very satisfactory, being tough and clean. Analysis showed that we had removed 1 per cent. of the silicon and $\frac{1}{2}$ per cent. of the carbon. Subsequently, by admitting more air into the furnace, and when melting steel scrap, the silicon was reduced to 0.396 and the carbon to under 1.0 per cent., so that we may conclude that, when the fluid metal can be charged into the open-hearth furnace, the time required for its conversion into mild steel will be very greatly shortened.

at such an elevation that when it is tapped the metal shall flow directly into either of the melting furnaces.

The cupola is erected to the designs shown in Figs. 4 to 6. The pig and scrap will be placed directly from the wagons on to the charging carriage at the foot of the incline, up which it will be raised and tipped into the charging hole. The charging apparatus is one that was designed by Messrs. Westray & Copeland, of Barrow, and has been in use at their works for several years. We are erecting a gas generator in connection with the cupola for two reasons: First, because we have no surplus supply of gas available at the works; and, next, because I am not sure that we should obtain as satisfactory results when using cold gas from our mains as when it passed hot from the generator directly into the furnace. On the important point of consumption of fuel in melting we were abundantly satisfied, for the coal charged into the generator during the about nine shifts' work only averaged about 1.44 cwt. to the ton of metal charged into the cupola, thus surpassing the most economical cupola working that has come under our notice. On the results we obtained, we think, we are justified in believing that, besides its adaptability to the end I had in view in commencing these trials, this furnace is also extremely well fitted for extensive iron foundry practice, where continuous melting is required, and also, and more especially, to Bessemer-steel works, where fluid metal is not available; and I may state that, as the flame can be made to a large extent oxidizing or reducing at will, the composition of the metal need not be changed during melting, the silicon, &c., necessary in the Bessemer operation remaining therefore untouched.

Producer Gas in Glass-Making.

The Bellaire correspondent of the *Crockery and Glass Journal* writes as follows in a recent issue of that paper:

For some time past the question of cheaper production has been agitating the minds of glass manufacturers in the Ohio Valley, and during the leisure of the past summer some of the leaders in this city embraced the opportunity to investigate the various furnaces in use, and devise, if possible, some plan whereby the cost of production could be lessened. The committee that was sent through the natural gas and other sections returned to the city highly elated over the result of their examinations, and with feelings of satisfaction that those favored with natural gas would not have any great advantage over other manufacturers if what they had learned would stand a practical test. That test has been made, and the result is very satisfactory. It is a gas furnace, the gas used being that generated from slack waste coal and air. The Crystal Window Works were the first to make a practical test, but it is adapted as well to the flint-glass factories, and it is quite probable that by next year it will be in general use at all of the glass factories in this city. The first melt of glass was made for less than one-fourth the cost of fuel usually used and that is still used at other factories. At either end of the usual cave beneath the furnace is a generator 5 x 9 feet, and between these is a large air-chamber 10 x 21 feet, in the center of which is a sort of fan that sends the cold air to each end of the cave, where the generators are. These generators are fed with slack or refuse coal—which has heretofore been given free at the mines for hauling it away; but now that there will be a demand for it, of course more value will attach—through small holes at each end of the furnace, which are made right through the factory floor. At each of the four corners of the cave, in the generators, is a sort of flue 8 x 24 inches, into which issue the flame and cold air, where they mix, and the gas thus produced flows into the furnace from these four points as clear and hot as any fire ever produced in a glass furnace. The furnace is arranged with 12 flues, and there is an air feed below and a damper above, over which the master tinker has full control and can handle just as the condition of the furnace renders necessary. The experiment here, which has proven so highly satisfactory to all of the manufacturers, especially the first firm to make the venture, can be better understood as of importance by this fact: The first melt of glass in this new furnace—the first of the kind ever tried in this section—was made with 225 bushels of slack that cost 2 cents a bushel, delivered in the factory. A melt in this factory or in any of the ordinary factories requires 350 bushels of coal that costs 5 cents a bushel. This is the one item of fuel, while the new process lessens the labor about the furnace, makes a brighter, clearer fire, and consequently a finer and clearer quality of glass. It seems entirely safe to predict that the new process will be in general use throughout the Ohio Valley within a short time. The idea was gathered from an improvised furnace built and operated by some Belgian brothers in Pennsylvania, and unless some unforeseen thing occurs it will revolutionize the manufacture of glass in the Ohio Valley.

Among the recent improvements introduced at the Cobb's Iron and Nail Co., Aurora, Ind., is the Westwood self-feeder for nail-plate shears, which insures more uniform width in the strips of nail plate.

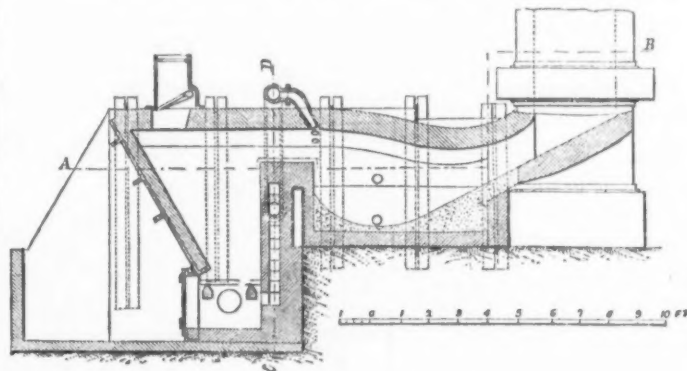


Fig. 1.—Vertical Section.

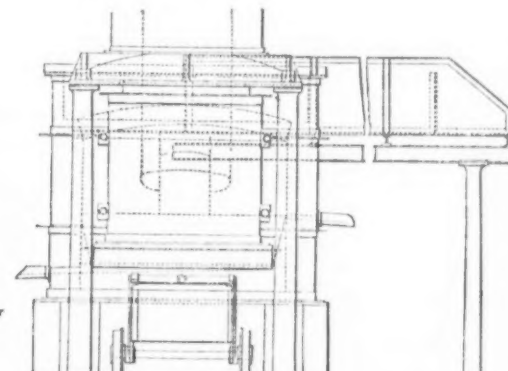


Fig. 4.—End Elevation.

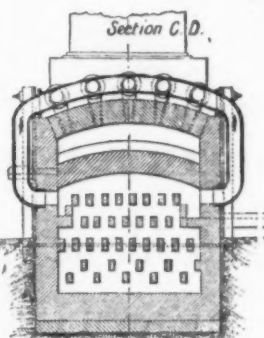


Fig. 3.—Transverse Section.

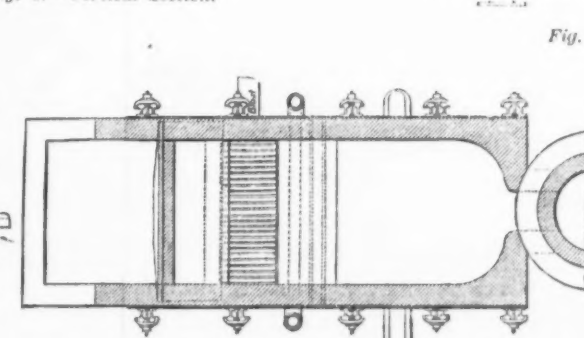
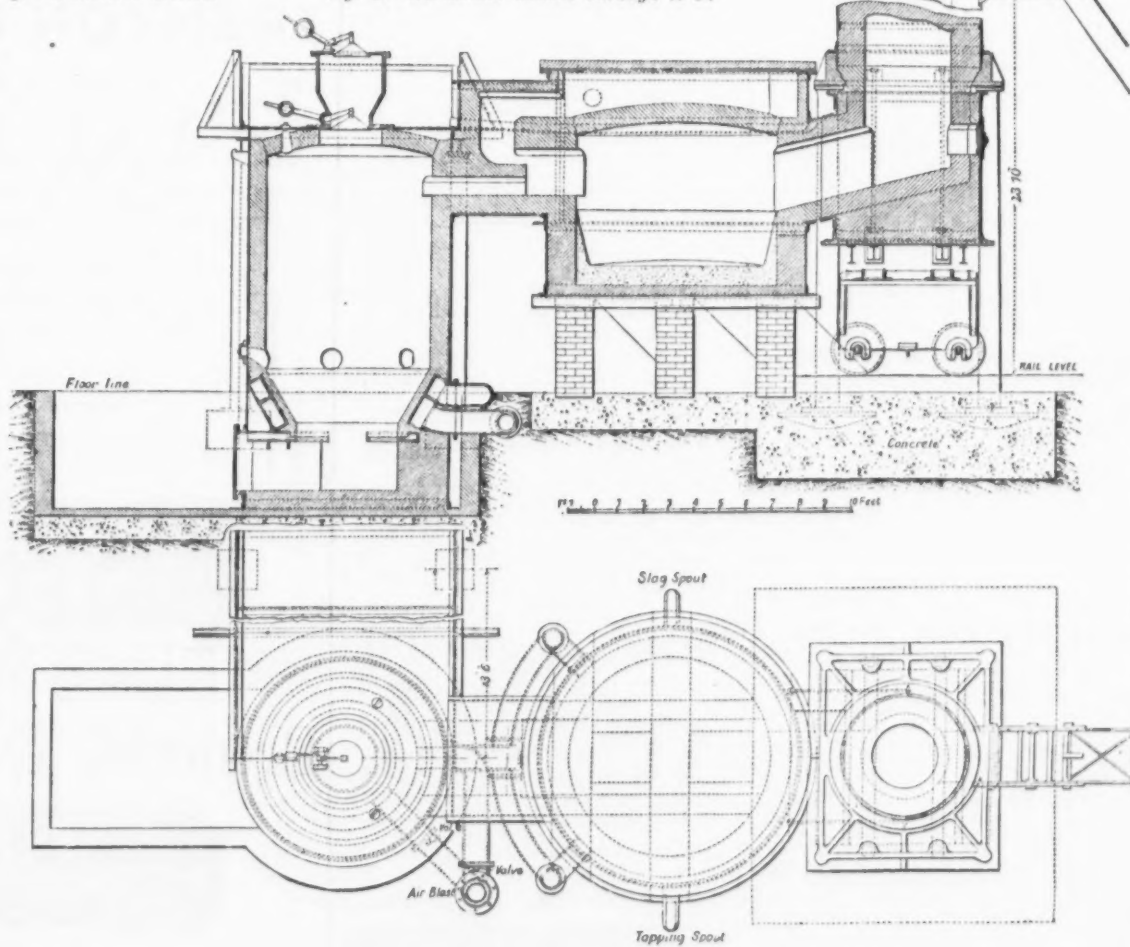


Fig. 2.—Horizontal Section Through A B.



Figs. 5 and 6.—Vertical Section and Plan.

THE RILEY CUPOLA FOR OPEN-HEARTH FURNACE-WORK.

and arrangements, we shall be able to remove the phosphorus in the hearth of the furnace. If we can accomplish this, then we shall be able to melt common iron in the basic-lined cupola, remove the phosphorus, and afterward finish the charge in the acid-lined open-hearth furnaces. With the permission of my directors, Mr. Dick, manager of the Blochairn Works, made a tentative experiment with a kind of improvised furnace and gas generator, very similar to Fig. 1, conjoined to a small foundry cupola. The furnace having been heated, pig iron was charged into the cupola through the ordinary charging-hole—about 12 feet above the hearth—tumbling it in upon the hearth, and filling up to near the charging level. The blast was then turned on from the Root blower, ordinarily used for blowing the cupola,

put on blast on Tuesday morning, and worked almost without intermission night and day until the following Saturday. After some days' work in melting pig iron, finding that everything was satisfactory, and that we had a very high temperature in the furnace, I determined to try to melt the steel scrap that would ordinarily be charged into the steel furnace. Commencing with the addition of 10 per cent. of scrap, the proportions of pig and scrap were very gradually changed, until, at the termination of our experiment, we were melting charges in which the proportions were six of steel scrap to one of pig iron. Our operations were stopped by the failure of the furnace lining, which, being only ordinary good fire-brick, could not successfully resist the high temperature to which it was exposed.

As these trials were made at a considerable distance from the steel-melting furnaces, and we were unable to transfer the metal from the cupola to the latter, I am not in a position to support this opinion by facts. But we are so satisfied on the point that we are now erecting a large cupola furnace near to the steel-melting furnaces, and I hope very shortly to have it in full operation. In the small experimental trials we melted at the rate of close on 2 tons an hour. In the large one we expect to put through double this quantity, or sufficient to supply four 12-ton melting furnaces as at present charged. But as we expect to save about half the time of the operations in the latter, and that two furnaces will thus require the same weight of charge as is now taken by four, our cupola is placed midway between two of them, and

* A paper read before the Iron and Steel Institute at Glasgow.

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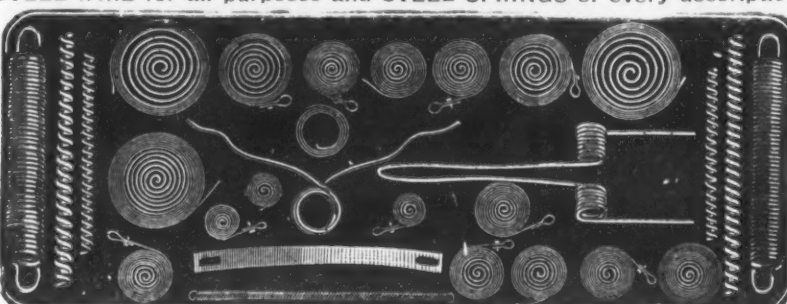
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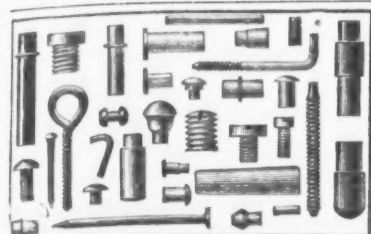


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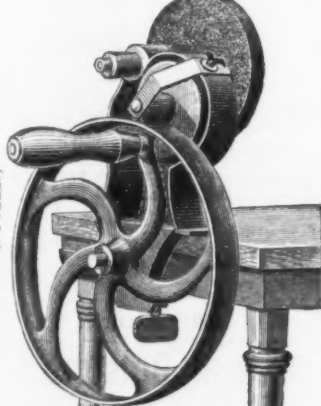
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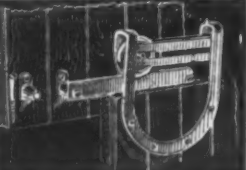
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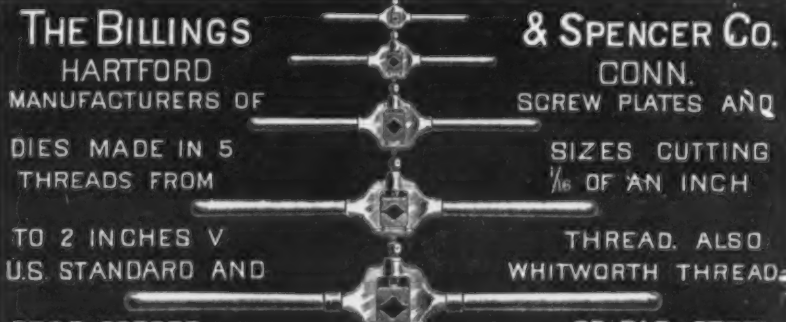
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Special for Axles, Best Neutral and Common.
Particular attention given to Iron for Special Purposes.

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Every description of Light Plates and
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Chains for Foundry Cranes and Slings.
"D. B. G." Special Crane Chain.
Steel and Iron Dredging, Slope and Mining Chains.
Ship's Cables and Marine Railway Chains.

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MANUFACTURERS OF
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Successors to CABEEN & CO.,
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AND FOREIGN ORES. AGENTS FOR CONNELLSVILLE COKE.

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Manufactured from the celebrated OTIS STEEL BRAND
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Quality and efficiency fully guaranteed. Prices as low
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ANALYTICAL AND CONSULTING CHEMISTS,
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Established in 1836.
Analysis of Ores, Waters, Metals and Alloys of all kinds. A special department for the
ANALYSIS OF IRON AND STEEL,
fitted with all the apparatus and appliances for the rapid and accurate analysis of Iron, Steel, Iron
Ores, Slags, Limestones, Coals, Clays, Fire Sands, &c. Agents for sampling ores in New York and
Baltimore. Price lists on application.

**Progress in Gas Manufacture and its
Present Condition.**

At the Cincinnati meeting of the Amer-
ican Gas Light Association Mr. Eugene
Vanderpool, in his address as president,
gave the following general review of pro-
gress in gas manufacture:

Considering the depressed condition of the
general business of the country and the
severe competition of oil lights, the develop-
ment and progress of the gas lighting indus-
try during the past year has been remarka-
ble. The outlook for the future is most
promising if the danger of overburdening
the industry by too much capital, forced
upon us by unscrupulous speculators, can be
averted by wise legislation that will protect
both the interest of the consumer and the
producer. The use of gas in nearly all of
our towns and cities has largely increased,
and the wise commercial policy of securing
a fair return upon the capital invested,
from a large in preference to a limited gas
consumption, is now almost universally
recognized and adopted. This would be
done to a far greater extent were it not that
we have learned from daily experience that
our franchises are precarious; and pruden-
ce demands the continuance of a man-
agement that takes into account the uncer-
tainty of our future profits occasioned by
so-called competition. It has generally been
found that an increased consumption speedily
follows a decrease in prices. This increase,
together with the economy that can and
must now more than ever before be exer-
cised in all industrial undertakings, will
keep a fair balance on the right side of the
account, and should induce us prudently to
continue to lessen our prices and enlarge
the output of our product.

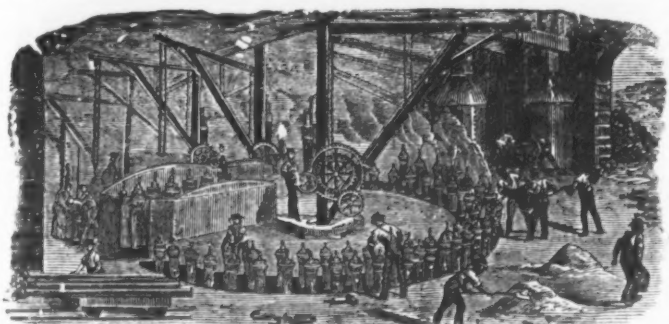
As an indication of the extent to which
prices have been reduced from time to time
in this country, and of the strength and
vitality of the industry, and the improved
methods of manufacture, it is only necessary
to state that there are many companies now
supplying gas at a fair profit at more than
20 per cent. below the cost, and over 50 per
cent. less than the selling price, of 15 years
ago. A remarkable and creditable showing,
indeed, particularly so considering the diffi-
culties under which we have labored in this
country. It is hardly probable that such
enormous reductions as these can be made
in the near future; but enough has been
done in the past to demonstrate that, if our
property is protected by wise legislation, we
shall sell gas of a high grade, within a com-
paratively short space of time, at as low
prices as it is furnished in any country in
the world. It is plain that the results above
stated could not have been obtained except
under the best management and the practice
of all known economies in manufacture and
distribution.

Any well arranged gas works fitted with
modern plant is radically different from
those of a few years ago. Every possible
appliance is now adopted whereby labor can
be economized. By means of improved
hoists and cars the cost of labor in handling
coal has been reduced one-half to two-thirds;
and, where the coal is taken directly into
the retort-house, a still greater saving is
made. If the coal is stored and then moved
into the retort-house it is cheaply hoisted to
a convenient level ready for charging the
retorts by means of improved hydraulic or
steam lifts. The retort-house is now built
with the charging floor above the ground
line, and larger retorts are set in an im-
proved manner, and, except in small works,
in benches containing a greater number of
retorts. The furnaces also are quite differ-
ent, being built either with large grate area
and a deep bed for fuel, making a simple
generator furnace, or else the generator fur-
nace is supplied with a system of recupera-
tion more or less complete. Besides, we now
have most ingenious mechanical arrange-
ments for charging the retorts with coal,
and drawing and handling the coke. As
compared with a few years ago, we show a
gain of from two to three times the yield of
gas per retort; from two to three times the
product of gas made per man; an economy
of one-half to two-thirds in fuel for the
carbonization of the coal; an increased
yield from the coal carbonized of 10 to 20
per cent.; a decreased wear and tear ac-
count, and an improved candle power. We
use new and very efficient apparatus for re-
moving the tar; ingeniously designed scrub-
bers for extracting the ammonia; improved
methods of mixing and using lime; efficient
and more economical ways of purification by
oxide of iron; and we are getting a better
return for our residuals than formerly, but
not as much as we should and will receive.
When we leave the works and come to in-
spect the system of distribution we find that
greater attention than formerly is given to
laying the main pipes. Their size has been in-
creased, they are systematically examined,
and all the service-pipes are inspected and
repaired. The latter are now laid with a
coating of some substance that prevents ox-
idation; the consumers' meters are peri-
odically and frequently tested; improved station
governors have been introduced, and the gas
is distributed more uniformly and under
lower pressure. The result is that our con-
sumers get more efficient service, cheaper
and better lights, and our unaccounted for-
gas amounts to 5 per cent. or less, instead
of 15 to 20, of our product.

While we have reason to congratulate our-
selves on the progress made in our industry
during the past, we know that the future
field for exploration and development has
possibilities that are sure to reward the well-
equipped and industrious searcher. When
the present method of carbonizing coal in
horizontal retorts is considered, it becomes
evident that the vertical retort, with its
probabilities as an economizer of labor, coal
and fuel, is well worthy of continued study
and experiment. While it may not be cer-
tain, considering the intense heat now used
in carbonizing, that a decided gain in the
volume of gas from a certain weight of coal
will be attained, still such a result is possi-
ble, and the study of the composition of a
gas distilled from an ordinary coking coal
favors the thought that some treatment of
the coal, before or during carbonization, or
of the resultant gas, might cause a decrease
in the large volume of methane produced,
and at the same time increase the volume of
hydrogen, and thus add some heavy gaseous

A. H. McNEAL,
BURLINGTON, - - - NEW JERSEY.

FLANGE PIPES.



General Foundry Work.

CAST IRON PIPES
FOR WATER AND GAS.

ESTABLISHED IN 1848.

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MANUFACTURERS OF ALL KINDS OF
HAMMERED AND ROLLED

STEEL,
WARRANTED EQUAL TO ANY PRODUCED.

BEST REFINED TOOL CAST STEEL

For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives,
Cold-Chisels and Machinists' Tools generally.

SAW PLATES

For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

Sheet Steel

For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,
Stamping Cold, &c., &c.

SIEMENS-MARTIN (Open-Hearth) PLATE STEEL

For Boilers, Fire Boxes, Smoke-Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement, is unequalled for
surface finish and exactness of gauge.

ROUND MACHINERY CAST STEEL

For Shafting, Spindles, Rollers, &c., &c.

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Cast and German Spring and Plow Steel.

"Iron Center" Cast Plow Steel. Finished Rolling Plow Coulters, with Patent Screw Hubs
"Soft Steel Center" Cast Plow Steel. Agricultural Steel cut to any pattern desired. [attached.
"Solid Soft Center" Cast Plow Steel. Steel Forgings made to order.

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SOLID CRUCIBLE STEEL CASTINGS

AND
Best Grades of Tool and Machinery Steel.

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APPROVED PATTERNS.

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Strongest Wrench Made.

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Agent for Jersey City Steel Company,
Manufacturers of **STEEL** Of All Descriptions.
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THURLOW, PA.,

Open Hearth and Crucible

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QUALITY EQUAL TO STEEL FORGINGS.

Can be Bent, Welded or Forged.

STEEL INGOTS, Best Stock, Furnished to Order.

Ship Patterns direct to Thurlow, Pa., via P. W. & B. R. R., or via P. & R. R. R.

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FROM

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Being desirous of securing a share of public patronage, we will endeavor to make our
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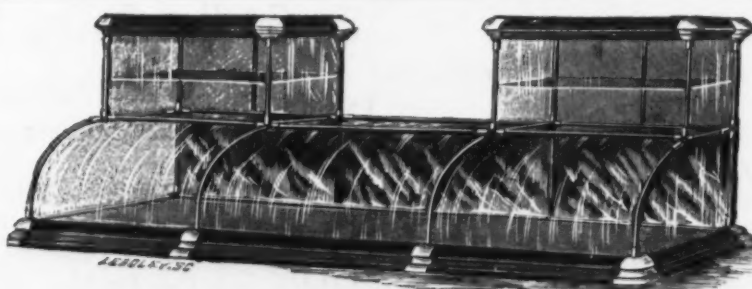
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Sanderson Bros. & Co.'s
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FOR TOOLS, DIES AND ROCK DRILLS.

Branch Warehouse: 39 Fort Hill Square, Boston.

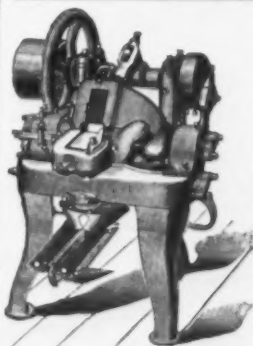


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All Hammers Fully Warranted.

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No Rattle.

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Well Tubing, Casing

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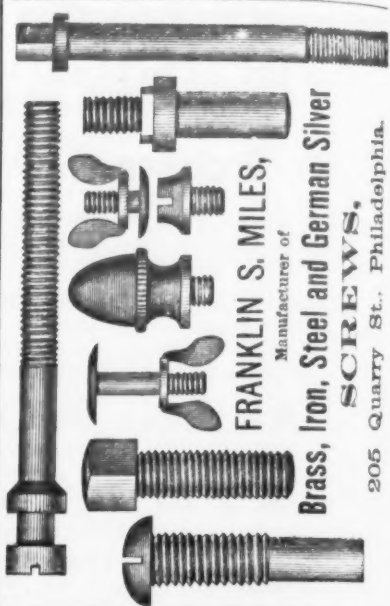
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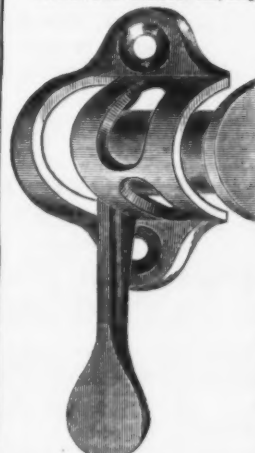
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FRANKLIN S. MILES,
Manufacturer of
Iron, Steel and German Silver
SCREWS,
Brass, 205
Quarry St., Philadelphia.

The Common Sense Sash Holder
and Lock Combined.

PATENTED MARCH 6th, 1885.



Is the best cheap
and most com-
plete Sash Holder
and Lock in the
market, and we
think has the
largest sale. It
holds the window
at any point, and
locks the same
when down, and
entirely prevents
wind from
rattling.
I am the sole
owner of this
patent, and so
manufacturer of
these fasteners,
and all persons
are hereby noti-
fied of this fact.
Any parties in-
fringing will be
dealt with ac-
cording to law.
Parties who have
been buying and
selling the "Prac-
tical Fastener"
so-called will be
well to heed the
warning. Orders
from the trade
respectfully sol-
icited.

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Sample Pair sent postpaid on receipt of price.



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Nickel Plated and
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CHAMPION

SINGLE BREECH-LOADING



SHOT GUN.

Top-Trap Action, Pistol Grip, Rebounding Lock, Pistol
Fore-end Fastening. For good workmanship, convenience of
manipulation, hard and close shooting, durability, and beauty
of finish, this gun has no equal and challenges the world.
PRICES: Plain Barrel, 12 bore, \$15.00; 10 bore, \$16.00.



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PATENT

HAND CUFF

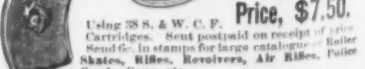
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Special catalogue of Police Clubs, Head Cuffs, Leg Irons,
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Price, \$7.50.

Using S.S. & W. C. F.

Cartridges. Sent postpaid on receipt of price.

Send for in stamps for large catalogue. Police
Clubs, Rifles, Revolvers, Air Rifles, Pistol
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Pumps,
HYDRAULIC RAMS,
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TRAFFIC
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A SPECIALTY
BLANK BOOKS MADE TO ORDER.
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JOHN MAXWELL,
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**BRASS, BRIGHT
TINNED WIRE
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Bird Cages.**
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Manufacturers of
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IMPROVED
FORCE PUMPS.
Latest, Cheapest
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DIFFERENT
SIZES
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PUMPS, HYDRAULIC RAMS, GARDEN ENGINES.
Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill
Pumps and other Hydraulic Machines in the World.
FIG. 120. FIG. 209. FIG. 70.
Wrought Steel Sinks.

One of the strong points of these sinks is the new coupling with which they are now supplied and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge.
The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the common article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

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Sole Manufacturers of
**SKINNER'S PATENT
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Universal, Independent and Eccentric.
By sliding a stud on the back of Chuck it is instantly changed from Universal to Independent, and vice versa. Each Chuck is guaranteed perfect. All parts are made interchangeable. Only the very best materials used in their construction. Reverse or special Jaws furnished when desired. Reverse or special Jaws furnished when desired. Reverse or special Jaws furnished when desired.
We also manufacture
Plain and Ornamental Butts.
Single and Double Acting Spring Hinges,
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Galvanized Pump Chain,
Patent Rubber Buckets,
Wooden Well Curb, Wood Tubing,
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WAREHOUSES: 108 Chambers Street, New York, and 164 Lake Street, Chicago.
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MANUFACTURERS OF

ANCHOR NAILS AND SPIKES. BRAND
Capacity, 1000 Kegs per Day.
Made from their own Pig Iron, insuring Regularity and Superiority in Quality.
ALSO
**FOUNDRY AND FORGE PIG IRON,
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**OLD DOMINION
CUT NAILS, BAR IRON.**

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IRON AND STEEL DROP FORGINGS
All shapes, small and large, including
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MALLEABLE, FINE GRAY IRON AND STEEL CASTINGS made from patterns to
order. Special attention given to Tinning, Bronzing, Coppering, Japanning and Fitting. A large line
of Carriage and Wagon Castings constantly on hand for the trade.

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BEARING DOOR MANGERS**
For House Doors, Car Doors, Elevator Doors.
Frictionless. Indestructible. Perfect. Send for Circular.
COHOES IRON FOUNDRY & MACHINE CO., COHOES, N. Y.

hydrocarbon that would largely develop the illuminating power of the mixture. While we hope and expect to receive better prices for our liquid residuals than are now obtained, we must ever remember that of late years we have competitors in this field who may prevent the realization of these expectations. When we consider the great improvements that have been made in the gas burner within a few years, and the still greater developments that are possible, it seems that our present business of furnishing light can never be taken from us if we do our duty either as investigators or by giving liberal assistance to those who are capable and well equipped for research in this direction.

A gas company fitted with a modern plant, and managed with skill, delivers to the burners gas that possesses more than 22 per cent. of the potential energy of the coal from which it is distilled; and it returns, in its changed condition, nearly 90 per cent. of the weight of the coal it carbonizes, saleable as gas, coke, tar and ammoniacal liquor. But when this energy is converted into light at the burner a large amount of it is dissipated in producing rays of heat instead of light. To make this more clear, it may be stated that the heat per hour per candle of light emitted by a regenerative burner of the first class is about equal to 85 heat-units, whereas, in the case of an arc electric light of the first class, it is not over 3 heat units. Thus the production of heat per unit of light is 28 times greater with gas than with electricity. But we remember with satisfaction that, while we deliver 22 per cent. of the potential energy of the coal to the burner, and utilize commercially nearly 90 per cent. of its weight, an electric-light company, with the best boilers, engines, dynamos and conductors cannot deliver over 5 or 6 per cent. of the energy of the same coal to its lamps, and that it has no saleable residuals left to reduce the cost of its fuel. Now, when we consider the above in connection with the statement that the theoretical flame temperature of our gases, under constant pressure, is equal to at least 5000° F. above their initial temperature, and due allowance has been made for the fact that this temperature is higher than can be practically reached on account of the dissociation of the gases, it becomes evident that there is a great margin left for converting more of the invisible heat into light rays, and that we have as yet advanced but a step toward what is in store for us. Whether the burner of the future will be an evolution of the present recuperative system; whether it will be dependent for its economy upon raising to incandescence a solid or gaseous substance in the flame, or whether some practical arrangement can be devised so that the gas can be burned under increased atmospheric pressure, none of us can tell, although we know an advance is probable in all of these directions.

The electric-light companies continue their efforts to obtain part of the lighting that has hitherto been done by us. Whatever progress they have made is due largely to the fact that by our present laws, and owing to the partiality of our people for the development of new things, no restrictions have hitherto been placed upon the electric-lighting companies as to the manner of erecting their distributing systems. They also have the great privilege of selecting their consumers, and they exercise it to the fullest extent. The ordinary consumers whose lights are in use but a limited number of hours per annum, and who collectively burn by far the larger amount of gas we furnish, are neglected and cannot be supplied with electric lights, while the comparatively limited number of consumers whose burners are lighted during many hours per annum are eagerly sought after. Particularly is this the case where the incandescence lamps are introduced. The cost of this system of lighting is largely dependent upon the time during which the lamps are lighted. A careful estimate by an acknowledged expert in all matters pertaining to electric lighting, of the expenses of operating such a system, including all the items of cost and interest on the investment, shows that there would be but a trifling difference in the cost of illumination whether the lamps were lighted 400 or 1500 hours each per annum. While it would not be possible to compete with gas on the basis of a 400-hour consumption per burner per annum, yet with a basis of 1500 hours and upward he claims that it could be done, provided the price of gas was maintained at a constant figure, whatever the duration of consumption. Wherever introduced into our large cities this selection of consumers whose lights are burned the greatest number of hours per annum has been carried out. Although there are those who do not believe in differential prices for gas, still to overcome this unequal competition, to retain a class of consumption as valuable to us as any we have, it may be necessary to grade our prices. There are no insuperable difficulties in making our charges dependent upon the quantity consumed per burner per month. It is quite clear that a large reduction in the charge for gas used in the daytime is advisable, because the gas then used costs comparatively little for the interest on capital invested in gas-holders, street mains, services, and meters. The running expenses, excepting those for coal, labor, wear and tear, remain about constant. Similar conditions exist in the supply of gas to consumers all of whose burners are lighted many hours per annum. There are good reasons, and these are the reasons why the electric-light companies select this class of consumers, irrespective of competition on such unequal grounds, for discriminating favorably in our charge to a consumer who is served by a three-light meter, and who uses the same quantity of gas per annum as another who is fitted with one ten times larger.

Our industry has passed through many trials. It has been threatened with extermination by rival systems of lighting; it has suffered from the infliction of burdensome and unjust taxation; it has been subjected to most unjust and unreasonable prejudices at the hands of the public. We have been covered with unmerited contumely and abuse. In spite of all your interest has been and is successful, and stands to-day, in the financial centers of the world, unrivaled as affording a permanent

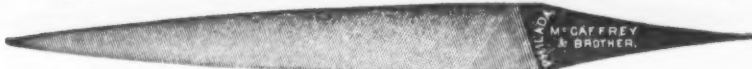
and remunerative investment. Notwithstanding these apparent signs of prosperity, there is an element at work in our own midst that threatens eventually to destroy, as it has already crippled, our capacity to profitably furnish light without serious danger from other systems of illumination. Reference is made to the existing and active combinations of unprincipled speculators who by every known means are imposing on the public, and endeavoring, for entirely selfish ends, to build and sell, but not to permanently operate, gas works in every city in our country where entrance can be had. This evil was never so rampant as now; it is our great danger, and threatens not only to ruinously overburden our industry with unnecessary and wasted capital, but also to make successful competition with other systems of illumination difficult, if not impossible, with profit. It is cause for sincere regret that so little has yet been done toward the regulation by the State of the profits, duties and privileges of gas companies, and toward the protection of their property, invested in good faith, and in such a manner as to be useless for any other purpose. We regret that more prompt legislative action was not taken in the State of Massachusetts, whose principal city had been supplied for many years by one company that, without legal restriction or control, and unthreatened by raids upon its property, had adopted and carried out the policy of supplying the best gas at as low prices as were consistent with what is recognized among conservative financiers the world over as a moderate return upon the capital actually invested. Notwithstanding this condition of affairs, and the absolute demonstration of its great superiority to the municipal authorities, the latter, without regard to the interests of the consumers, and in the absence of laws such as are provided in other civilized countries, granted the right to open their streets to so-called competing companies, and thereby forever fastened a grievous burden upon every gas consumer in their city. This action of the municipal authorities has shown most clearly the necessity of placing the determination of the serious questions regarding supply of gas in the hands of intelligent and unbiased men, appointed by the State, who would have the time to thoroughly consider them, and who would be honest and capable to act as arbitrators between the public and corporation. Our relations to the public are more peculiar, close and intimate than those of any other corporations.

The principle is now universally recognized and acted upon among ourselves that our consumers are entitled to receive the best service we can render, and that our charge for this should be only sufficient to cover its cost and secure a fair dividend for our stockholders upon the capital actually and prudently invested. But, however desirous we may be to carry out these principles, the fact remains that man is a suspicious animal and prone to think that the selfishness of his fellow-man will lead him, when uncontrolled, to take undue advantages of his opportunities. It is not creditable to this great country that we alone among civilized nations permit a system that inures solely to the pecuniary advantage of speculators who place the permanent burden of dear gas upon the public they have so easily cajoled. No argument is required to prove that competition in the manufacture and supply of gas is impossible. Experience teaches, without an exception, that "where combination is possible competition is impossible, and in every case has resulted in consolidation, division of territory and an agreement not to compete, the pooling of profits, or in the extermination of one of the companies, followed by an increase in the price of gas to consumers to compensate for losses and to pay dividends upon unnecessary and unproductive capital." There seems to be but one complete remedy for these evils, and that is placing our affairs under legal control, so that the public will know that it has a representative compelling the company to furnish the best service at reasonable rates, and the company will know that, as a consideration for these services, it will be entitled to receive a fair return on its capital and enjoy a permanent and secure franchise, not subject to attack from speculators or adventurers.

Since Germany adopted the policy of stimulating her industries her merchants have astonished Europe by their enterprise and sagacity. German competition is already cutting deeply into even the screw-making trade of Birmingham itself. The merchants of Germany have also recently memorialized the German Chancellor concerning the advantages England enjoys in maintaining her commerce in America, Africa and Asia by having well-paid consuls at all important points on these continents, while the German consuls are all merchants, who are often aliens, and who all, as a rule, spend their time in looking after their own individual interests, without any desire to aid in the extension of the commerce of the Empire. It is understood that Prince Bismarck has already begun the work inspired by this memorial; that he has replaced many of these merchants as consuls by well-chosen State agents, and that he intends to follow the English example everywhere that it is possible to introduce German products or manufactures with advantage.

A furnace for heating with natural gas should have a radiating surface so large as to be capable of transmitting the heat as fast as created, leaving none to go up the chimney. By dividing the heat over a large surface its intensity is lessened, red hot surfaces are avoided and a large volume of nicely warmed air is produced, instead of the usual hot blast with its attendant headaches and other evil effects. A furnace of this description, costing only \$45, with a capacity equal or superior to the most costly coal-burning furnaces, and which can be placed in cellars not intended for a furnace, has been devised by Mr. Howard Morton, Lewis Building, Pittsburgh. Several of these furnaces worked successfully through last winter. It is claimed that the furnace will heat an entire house with less gas than will suffice an ordinary grate. As to durability, an examination of one which had been used during the entire winter showed no effects of the heat whatever.

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Superiority acknowledged wherever used, sold or exhibited.

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The above cut represents the "EUREKA" CLUB SKATE, the most complete and perfect Skate in the market. The clamps and foot plates are made of Steel, the blades of welded Steel and Iron, tempered expressly for this purpose. When fastening this Skate to the shoe the heel clamps are stationary. The toe clamps are drawn together and the corrugated bar pressed back against the heel simultaneously by one motion of the lever, which is under the instep and cannot by any possibility be thrown out of position while skating, making a most perfect and secure adjustment to the shoe.

Trade Price List (No. 1, Blue Top) per pair, \$5.00. (No. 2, Nickel Plated) \$6.00. Discount to the Trade. Sizes, 8, 8½, 9, 9½, 10, 10½, 11, 11½, 12 inches.

"EUREKA" CLUB ROLLER SKATE.



The special attention of the Trade is respectfully called to above named new Roller Skate, now being placed in the market. Its simplicity of construction and yet its great strength and the mode of adjusting the same make it the most perfect of All Clamp Roller Skates ever offered. The clamps are operated by a lever simultaneously on both heel and toe, thereby requiring no key or wrench. The "EUREKA" CLUB ROLLER SKATE is handsomely nickel-plated, and the rollers are made of the best quality of boxwood and with Brass Bushings, making the skate run easier than any others manufactured. Quality and workmanship considered, the "EUREKA" CLUB ROLLER SKATE has no equal. List, \$7.00 per pair. Address

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LIGHTNING HAY KNIVES. WEYMOUTH'S PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting post and ditching marshes.
The blade is best cast steel, spring temper, easily sharpened, and giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.
They are nicely packed in boxes, one dozen each of 30 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY
HIRAM HOLT & CO., East Wilton, Franklin Co., Maine.
For sale by the Hardware trade generally.

CAUTION:

We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an Improved Hay Knife.
The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.
All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture.

HIRAM HOLT & CO.
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We are now making our Improved York Patent Steel, Full Clamped, Club Roller Skate, the best in the market, full nickel-plated, with an adjustable tension device that can be fixed to suit the weight of wearer in a moment. The action is easy and the Skate can turn in a radius of about 20 inches. We are now making a Superior Rink Skate, Steel Plate, with all of the improvements. The latest and most complete Rink Skate out. Send for circular and price list to

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Having lately withdrawn from the combination, we are at liberty to make such terms and prices as we think expedient. Quality guaranteed the best in the market. Any variation from regular sizes and shapes made to order from samples.

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Being the largest concern outside the combination, we are prepared to supply the Trade with a full line of goods. All goods made from best of stock. Satisfaction guaranteed. Samples sent free. Send for price list. Goods delivered in Boston, New York, Philadelphia, Baltimore and Chicago.

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Knife Blunt,
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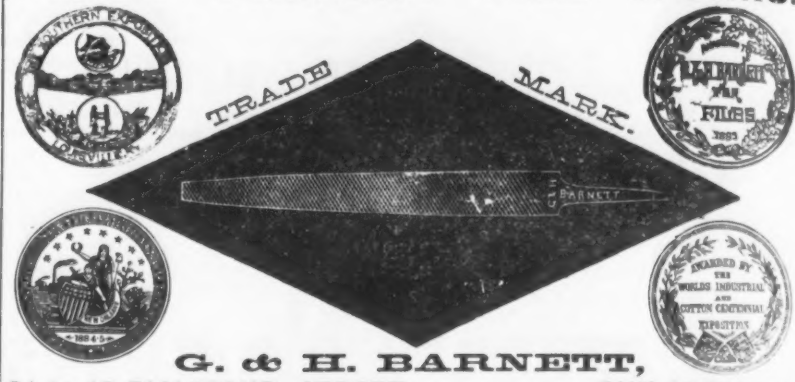
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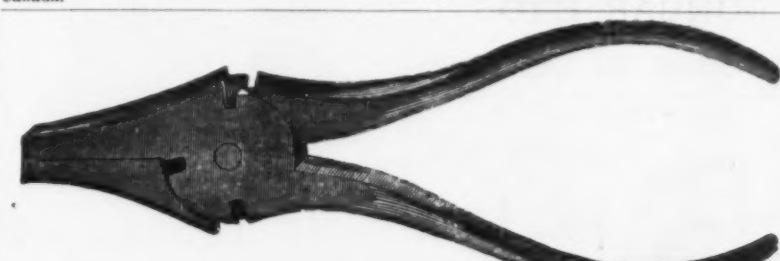
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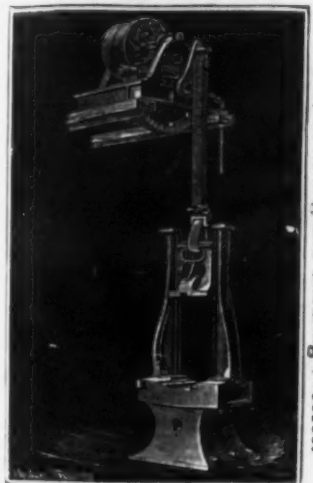
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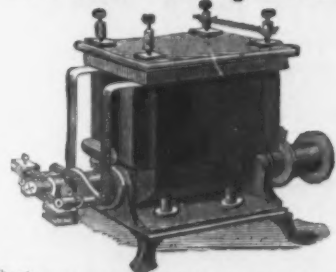
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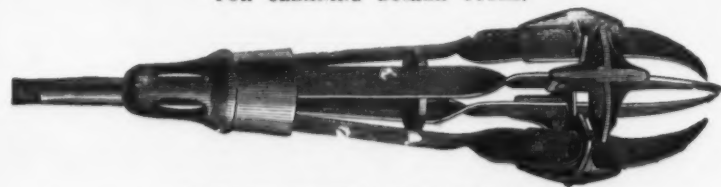
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PERFECT CARPET STRETCHER1. Represents Stretcher ready for use, also the
Cushioned Knee Rest; Block, 5 x 8 inches.
2. One inch full-size section of convex wire.
The only stretcher that receives the recom-
mendation of the entire trade.
It has over 400 convex steel points, 3-16 inch
long, set in leather, that are inserted into the
carpet, therefore cannot injure it. It is neat,
durable, convenient, and sells on its merits.
It is the only upholstered Stretcher made.**EVERY STRETCHER WARRANTED.**

Price, \$1.00. Liberal Discount to Trade.

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PREMIUMS AND MEDALS:

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Padlocks, Night Latches;
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Locks for Drawers, Doors, etc. Etc.
New York, Philadelphia, Baltimore,
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FAIRBANKS & CO., Agents,
MILLER LOCK CO., Phila., Wash'ton.**Electric Haulage by the "Tel-
pherage."**

The most recent and perhaps most in-
genious example of the conversion of elec-
trical force into useful mechanical work is,
according to *Iron*, the system of automatically
transporting goods known as "telpherage,"
the practicability of which has been demon-
strated by the construction of a line nearly
a mile in length on the estate of Lord
Hampden, at Glynde, in Sussex. This
system is the invention of the late Prof.
Fleeming Jenkin, who, however, died be-
fore the plans for the line were completed,
and they were perfected by Professor Perry,
who succeeded Professor Jenkin as engineer
to the Telpherage Co. The line has been
finished, and was recently formally opened
by Lady Hampden, upon which occasion
a large number of electrical engineers
and others interested in scientific matters
were present. The object of telpherage
is the conveyance of mineral, ores, grain,
or, in fact, any kind of goods easily
divisible into parcels of 2 cwt. or so, at
a speed of from 4 to 5 miles an hour.
The road and the skips employed are some-
what similar to those used in wire rope
tramways, but instead of the wire rope
doing the work of haulage it is stationary,
the motive-power being electricity. The
system had previously been tried experi-
mentally at Weston, in Hertfordshire, where
a short line was put up some time since.
The line at Glynde is a double one, nearly a
mile long, and is composed of a double set
of steel rods each 66 feet long and 3/4 inch
in diameter, which are carried 8 feet apart
on wooden supports, at an average
height of 18 feet above the ground. The
two ends of the line are of bulb angle
steel with supports placed 13 feet apart.
The carriers or skips are iron trough shaped
buckets, each holding about 2 cwt., and sus-
pended from the line by a light iron frame,
at the upper end of which is a pair of grooved
wheels running on the line of rods. A train
is made up of 10 of these skips, which are in
electrical connection with each other, and
with a Reckenzaun electrical motor, which
is placed in the middle of the train, having
five skips in front of and five behind it. At
a point about midway of the length of the
line is the engine-house, in which is a steam
engine which drives the dynamo. From
these latter the current is led to the line,
and thus to the electrical motor which moves
the train. The object of the line at Glynde
is to carry clay from a pit on Lord Hamp-
den's estate to the railway station. Arrived
there, it is delivered into trucks and sent by
rail to the works of the Newhaven Cement
Co.

The skips are loaded at the pit each with
about 2 cwt. of clay, the train thus carrying
1 ton. The motor is started by a laborer
touching a key, when the train speeds on its
way to the Glynde station at the rate of be-
tween 4 and 5 miles an hour. On reaching
the siding another laborer upsets each skip
as it passes over a railway truck, into which
the clay is thus loaded. This upsetting,
however, will eventually be performed auto-
matically by means of a lever on each skip,
which will come into contact with a project-
ing arm as it passes over the truck. The
attendant at the discharging end of the line
has full control over the train, and can start,
stop and reverse it at will, as can also the
man at the pit end. Two trains have been
provided at Glynde, but only one is at pre-
sent used, that being found sufficient to de-
liver 150 tons of clay per week at the station
—the minimum quantity required by the
cement company. The trains need no atten-
tion when running, as they are governed to
run at the same speed both on rising and
falling gradients. An automatic block sys-
tem is provided, so that as many as 20 trains
can be run on the line without the possibility
of collision.

Turning to the technical details of the line,
we may observe that the method employed
to supply the current to the motor is what is
known as the cross-over system—that is, the
alternate spans are connected with the posi-
tive and negative poles of the dynamo re-
spectively. By using a shunt dynamo and a
Willans governor the electro-motive force is
kept constant at the near end of the lines,
varying the speed of the engine to give the
current required, however the number of
trains running may vary. The current is
roughly proportional to the number of trains
running. The motors run in parallel arc. The
resistance of the rods used to support the
train and convey the current is moderate
compared with the resistance in each motor,
and the motors have an electro-motive force
which is large relatively to that produced by
the dynamo. The consequence of this is that
there is little difference in the electro-motive
force available to drive the several motors,
whether these are near the dynamo or far
from it. Extreme constancy is quite un-
necessary under the actual conditions of
working, which in this respect are unlike
those of electric lighting. The speed and
power are controlled by a centrifugal
governor of novel construction. The
weights and springs are so combined as
to be in unstable equilibrium at the
critical speeds. Thus at, say 2100 revolu-
tions per minute, the weights will fly out,
breaking contact sharply and widely, and
they will not return until the speed has
fallen to, say, 1900. By this plan a perma-
nent arc at the contact is avoided. Injury
to the contact pieces is prevented by provid-
ing a carbon rod as a secondary contact.
This rod is very slowly consumed. By this
plan not only is the speed regulated, but the
power is distributed in the ratio required by
the several motors. While ascending a steep
gradient, the current will be on for almost
the whole time, and while descending a
steep gradient it will be off altogether. On
level lines it may be on for, say, a quarter
of the whole time of running, being supplied
for, say, two seconds, and then cut for six
seconds. This plan avoids all waste in
shunts or interposed resistances, and has
been tested with good results. The current
cut off by each governor is too small to in-
jure the dynamo. The block system to which
we have referred can either be arranged
automatically or can be worked by hand at
termini and sidings. In both cases an idle
section is used. The main circuit is never in-
terrupted, but one section of the cross-over
system is simply cut out. As this is done

when no train is in the section, there is no
flash, and very simple electro-magnetic ar-
rangements are applicable.

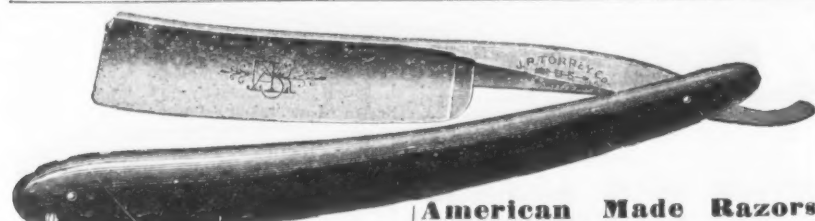
Such is electrical haulage, the latest out-
come of electrical science as ingeniously de-
vised by Prof. Fleeming Jenkin, and finally
put in practice by Professor Perry, assisted,
we believe, by Professor Ayrton, for the
Telpherage Co., of London. The success
of the system from a scientific point of
view is placed beyond question. Its com-
mercial value, however, yet remains to be
proved, as the cost of the present mile of
line cannot be taken as representing the cost
per mile of any subsequent length. More-
over, it is admitted that in some of its de-
tails the line at Glynde is still open to im-
provement. In these circumstances it would
be as well that the great advantages claimed
for the system were substantiated by work-
ing the line at Glynde to its full capacity for
a lengthened period and under careful
independent supervision.

The Navies of Europe.

Naval Constructor Philip Hichborn, who
was sent last year to visit the principal dock-
yards of Europe, has submitted to the Sec-
retary of the Navy a long report, which is
said by high naval authorities to be a work
of great practical value. He says that in
the national dockyards of Great Britain
about 18,000 men are employed, their aver-
age pay per day being \$1.03. The total sum
expended by the British Government in the
last 15 years in the construction and repair
of vessels of the Royal Navy aggregates
\$179,649,625, with incidental charges which
swell the total to \$217,319,275, or about 1/5
of the total naval appropriations for the
same period. The Imperial Navy of Ger-
many dates from October 1, 1867, from which
time up the present about \$140,000,000 has
been expended upon the naval establishment,
with the result that Germany now ranks as
the fourth naval power. The navy list of
Russia is formidable in the number of ves-
sels and men, which places the nation third
in the rank of naval powers. The apparent
navy aggregated at the beginning of the
present year 370 vessels of all descriptions,
but a cursory examination revealed the fact
that probably not more than 120, exclusive
of torpedo-boats, can properly be classed as
vessels for offensive and defensive warfare.
France has five dockyards, collectively com-
prising an area of 900 acres. She has 24
dry docks, and her establishments are com-
plete in all the requirements for building,
repairing, fitting out and pre-ervation of
ships and the manufacture of stores and
articles required for a navy. The quays,
basins and slips are of the most substantial
character, which if duplicated in the United
States would require decades and several
hundred millions of dollars. Convict labor
has been largely utilized in such national
work, while, besides, the wages of free labor
are sufficiently low to accomplish a great
deal of work at an outlay which in this coun-
try would be regarded as insignificant.

In his chapter upon torpedo-boats he says
these vessels are now considered so essential
that no European navy of note has a flotilla
of less than 50, while the stronger powers
have fleets of 100 or more. Coasts have been
divided into torpedo districts of 100 or more,
each with its complement of boats, and the
crews, thoroughly organized, are kept contin-
ually exercised in the management of the
vessels. Of the seaworthiness of such boats
he says there can be no longer any doubt,
their long voyages, in some cases under
steam and in others under sail, to Rio
Janiero, Buenos Ayres and the Black Sea
having conclusively demonstrated their
ability to survive very severe weather.
Lately, during an evolutionary cruise of the
French Mediterranean squadron, the torpedo-
boats were able to keep the sea, while
the Tonnere and Vengeur, large ships,
were compelled to seek shelter from the violence
of the gale. The defensive value of a
fleet of cruising torpedo-boats, he says, can
hardly be overrated. No blockade can be
maintained in their presence, yet, if prop-
erly supported by tenders with coal and sup-
plies, they form of themselves an efficient
blockading force. The cost of one such
boat completely equipped is from \$60,000 to
\$65,000, and they require from 10 to 15 men.
To operate to the greatest advantage they
must attack in numbers; it is not sufficient
to supply each port with one or two. In his
description of ships built and building he has
the following comment upon the Chilean Es-
meralda: "For offense the Esmeralda is
powerfully equipped, but she is vulnerable
throughout, and there can be no doubt that
even a lightly-armed antagonist could play
havoc in the machinery spaces, and destroy
or dislocate the delicate hydraulic mechan-
ism by which the heavy guns are worked.
On account of her small coal supply, vulner-
ability, unheated bottom, and insignificant
spread of sail, I am unable to see the prop-
riety of building similar vessels for the
American Navy."

In his conclusion, Constructor Hichborn
says: "Recently there has been a great
controversy between the leading construct-
ors of Europe as to the best manner to
utilize 10,000 tons of displacement. One
officer of high station sets a high value on
one quality and another officer upon some-
thing else. The result is that at the present
time there are nearly as many types as there
are ironclads afloat. The lack of important
naval battles in recent years stands in
marked contrast to the desperate efforts of
European powers to equip extraordinary
vessels, designed to combine the invulnerable
and the indestructible. A naval war would
doubtless demonstrate that the elaborate
schemes of fleet tactics which have been the
theme of many essays by naval officers have
been chiefly valuable as mental exercise,
and that, though importance may attach to
a skillful disposition of forces in the begin-
ning of an engagement, yet, in view of the
rapidity with which vessels would be dis-
abled by the tremendous means of offense
antagonized, and the inability to see or obey
signals amid the confusion and obstructing
smoke, it is evident that such an engage-
ment must presently become a pell-mell
scrimmage. Such a war, or one such
battle, would prove what has long been the
apprehension of intelligent officers—that the
war ship of our day has become far too
complicated for the people who may be



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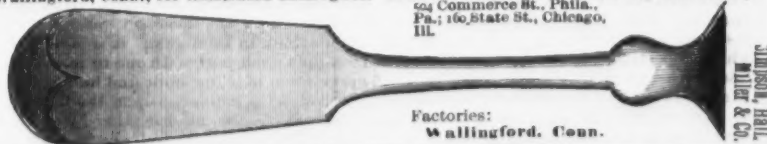
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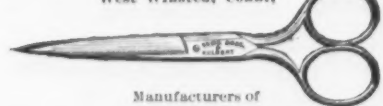
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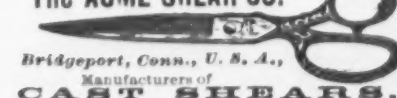
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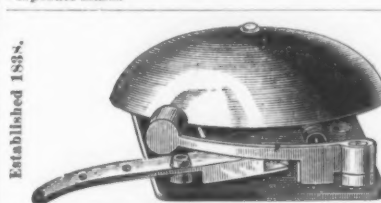
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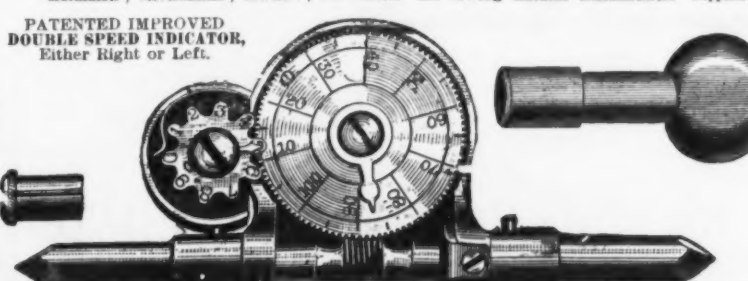
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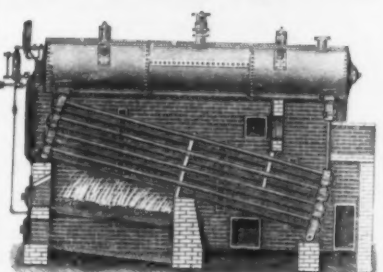
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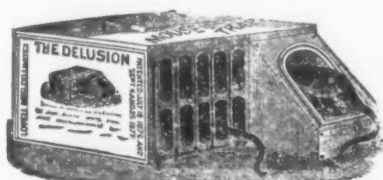
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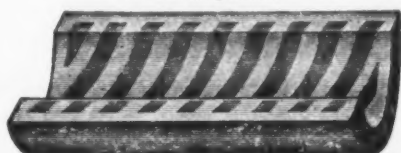
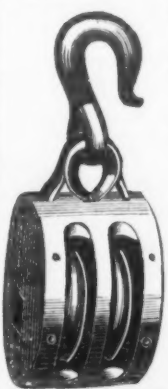
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English Letter.

(From Our Regular Correspondent.)

LONDON, OCTOBER 26, 1885.

THE TRADE OUTLOOK

has not brightened to any appreciable extent since my last letter. The coming general election begins to cast its shadow before it, and it is more than probable that the latter half of November and the first fortnight of December will be greatly interrupted by electioneering doings. Already the newspapers contain little besides the reports of the floods of talk poured out daily upon the heads of a patient and long-suffering people all over the country. Both sides are girding up their loins for the struggle, and are taking stock of what they suppose to be the intentions of the voters. Candidates are becoming extraordinarily busy, as well as inordinately polite, and the 2,000,000 new voters are being pestered to the verge of persecution about subjects as to which the great majority of them have not the slightest comprehension. As is not at all unusual on similar occasions, both parties confidently count upon success, although it is to be noted that the Conservatives (also styled the "Tories") do not profess that their majority will be so great as do the Liberals on their part. At the headquarters of the Liberals the greatest confidence prevails, and it is boasted that they will have a majority sufficient to beat the Conservatives and Parnellites in combination. Mr. Gladstone is about to speak in Scotland, and his admirers predict that he will dispel and crush his opponents even as the summer sun would melt snow and ice. No doubt Mr. Gladstone is still a great power in the land, but I doubt whether the Liberals are certain to be as successful as they predict. Many influences are at work among the lower classes as well as among the middle classes of which the more sanguine Liberals take too little account. Fair trade has a strong hold upon the artisans, especially in the North of England, and the agricultural laborers are not so bitterly opposed to the farmers as is represented by men who have lived all their lives in the towns. Then, again, the Liberals have committed a serious tactical mistake in bringing forward the question of disestablishing the church. They have seen this and have shelved the issue for the present, but the mere mention of the question has alarmed many moderate men and will no doubt cost the Liberal party thousands of votes. Of all these points the fair-trade issue is the one most likely to turn votes, and as some of the Conservative leaders favor inquiry into the subject, while the Liberals point blank refuse even to discuss it, it seems reasonable to suppose that the fair traders will vote for the Conservative candidates. Parliament as now constituted will be dissolved on November 18, and the elections will be completed in the course of three weeks or a month thereafter. If we could wholly do without a Parliament we might be better off, and should certainly be saved the awful waste of time which is caused by the debates and the perusal of the reports thereof. There is no chance of this consummation, however, and we have no alternative but to face the electioneering chaos and to hear the result with equanimity.

THE IRON MARKET

has been very quiet since my last report, and there is really very little to place on record in connection with any branch of the trade. There is a fair amount of business in hand all over the country, but new orders are not quite satisfactory, and some of the firms whose productive capacities are large are running through their specifications more rapidly than they would like. Simultaneously there is no improvement in selling values in general iron products, and in some lines the better feeling chronicled some weeks ago seems to be passing away, with results as to prices which are not favorable to producers. There is little or no speculation or buying ahead; consequently, it may be assumed that consumers and merchants have not much apprehension of any early advance in quotations. At Glasgow there has been a quiet market, on the whole, in respect of warrants, which closed at 41/10 1/2 per ton. Scotch makers' brands are not in great demand, and some of them are 3d. @ 6d. 1/2 ton cheaper on the week. The reserve stocks at Glasgow continue to increase largely, and so long as that is the case, especially while shipments are on a poor scale, it is useless to look for any sustained improvement in values. At Middlesboro' pig iron remains weak at about 32/3 @ 32/6 for No. 3 foundry, the shipments being moderately heavy, but the local consumption very limited. On the West Coast mixed numbers of hematite pigs are about 43/, and are not in other than small request. Tolerably good deliveries are being made on running contracts, but the make is still outside the actual wants of the market, and there is no life in the business. Elsewhere crude irons are quiet and a shade easier, if anything, than they were a fortnight ago. Heavy manufactured iron is without change. Fencing wire is as dull as heretofore. For galvanized sheets the demand is good, but it is reported that values, as a whole, are not quite so firm as they are represented to be in some quarters. Ordinary finished iron is about the same as of late, and buyers with large orders or cash in hand may be said to still have the best of the situation. All quotations are more or less nominal and unaltered. The sheet mills are probably the best employed, and prices are steady all round. Old materials are steady, particularly old rails, but quotations are not greatly changed. Freight rates are steady at about late rates, pig iron by ordinary steamers from Glasgow to New York being 2/ @ 2/6 1/2 ton. Competition in Australian freights is doing good to manufacturers, and quantities of goods are being taken for Sydney and Melbourne at 7/6, although by a process of selection other goods are being charged 15/. It is under-

stood that these low rates are being made by the "ring" in order to close up their latest competitors. Steel is in tolerable request for general purposes, especially Bessemer rolled sorts, which are meeting with more general application every year. For mild steel bars prices are about £6. 10/ @ £7; hoops, £6. 10/ @ £7; sheets and plates, £8 @ £8. 10/. The crucible-steel houses are mostly fairly engaged, but not busy. Steel rails are very quiet at late quotations, and very few orders are about excepting that for the colony of Victoria.

SCOTCH PIG IRON

is very quiet and rather weaker, with a statistical position and a general outlook which are not at all likely to favor an advance. There are now 91 furnaces in blast in Scotland, as against 95 a year ago. Of these 76 are on ordinary Scotch pig. In Connal's stores there are 631,253 tons (an addition of 1510 tons last week), as against 581,012 tons this date, 1884. The maximum quantity stored was 637,526 tons in June, 1882, which total is not unlikely to be surpassed shortly. Shipments showed a comparative decrease of 1922 tons last week, and are 84,196 tons behind to date this year, while the Middlesboro' pig imports are 95,393 tons ahead. Current quotations:

Deliverable alongside.	No. 1	No. 2
Gartsherrie, at Glasgow	40/	43/6
Coltness, "	40/	45/6
Langloan, "	47/6	45/
Summerlee, "	47/6	43/6
Caldar, "	51/6	43/6
Carnbroe, "	45/6	43/
Clyde, "	46/	42/
Monkland, "	42/3	40/
Quarter, "	42/	40/
Govan, at Broomielaw	42/3	40/
Shotts, at Leith	47/	46/6
Carron, at Grangemouth	51/	47/
Kinnell, at Bo'ness	44/	43/
Glenarnock, at Ardrossan	45/6	42/
Eglington, "	42/	39/
Dalmellington, "	43/	40/

ENGLISH VS. AMERICAN CHARCOAL PIG.

Some weeks ago I referred to American charcoal pig iron having been sent to this country. A reference to the subject also appears to have been made by your contemporary, the *Ironmonger*, which has called forth the following letter from the only English makers of charcoal pig:

Sir: As the "one firm producing charcoal pig iron" in this country, and therefore, we assume, the one alluded to in your article on "American Pig Iron in England," in your last week's issue, allow us to point out two facts:

1. That there is charcoal pig iron and charcoal pig iron; the expression covers qualities and grades much the same, in their class, as in the case of the ordinary coke-smelted irons. Charcoal iron is smelted by both the cold and hot air processes, and the result is as different in quality and value as in iron smelted by the same processes with coke.

We assume the iron sent by our American competitors to be hot-air smelted; if so, we may say without egotism that it is decidedly inferior in quality to our own Lorn iron, which is produced from the purest of native hematite ores by the cold-blast process alone.

For inferior work to that for which our iron is made and used there may be a market for a cheap hot-blast charcoal iron, but it is hard to see in that case how it is to out Swedish iron or the very excellent qualities of coke hematites now specially made by our West Coast smelters for the commoner kinds of malleable castings, and to succeed commercially we venture to think it must do this.

2. Your assumption that our "means of production are limited to about two or three furnaces" is not perfectly correct.

Our production is limited at the present moment to the extent you mention, but that is a question only of supply and demand; our means certainly are much more elastic than you appear to be aware of, and we should find it in no degree embarrassing to meet the considerable demand for charcoal iron which you think could not be met.

If the quality, and, consequently, the price, of our Lorn iron be too high for our friends the malleable founders, then by all means let them make their exact wants known to us, and, if a charcoal iron is really a necessity, it will be a revelation to us if we cannot produce one that will spare them the need of calling on the Jupiter of the United States to help them; we, however, doubt the existence of this great void.

In conclusion, allow us to mention a third fact, which is that we regularly export our iron to the United States, where it has been used for years by founders whom we may believe to be quite conversant with the qualities of their own native irons. Yours truly,

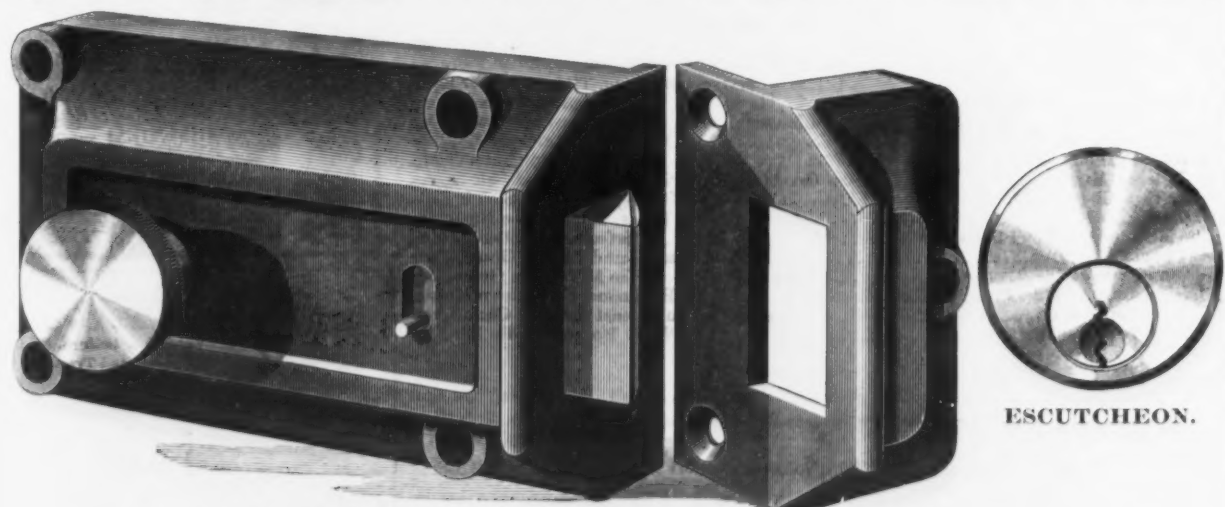
HARRISON, AINSLEY & CO.

3 East India Avenue, E. C., October 18.

TIN PLATES.

In London the past week has brought no new feature. In fact, the market has been very quiet, American buyers showing no disposition to place orders. The market, however, remains firm at 14/6 @ 15/ for IC cokes, f.o.b. Liverpool, and most of the makers are reported to be fairly well booked for a little time ahead. At Liverpool the firmness of the tone continues and the quotations sent out are maintained quite firmly, though many of them are so high that it is hardly expected, even by those who make them, that they will result in business. This week has been a pretty busy one again as regards inquiries, and considerable business has been done when the various (big and little) lots booked are totaled up. On the whole it may be said that prices have been fairly steady, considering that there was an increase of 50,000 boxes in the stocks during last month. The inquiry has been most on steel plates with coke tinning, both Bessemer and Siemens qualities, while those for coke and charcoal tin plates have been more than usually numerous. The demand for ternes has fallen away again. But this is only to be expected at the present time as the ternes season has now virtually closed for a few months; what orders come forward are for certain old and well known brands. The other newer hands which are not so well known have to cut in they can at best obtainable prices or drop out of the competition altogether. The prices for these range in a general way from 14/ to 15/ IC; special sorts 1/ @ 2/ more. Ordinary kinds of coke tins are 14/6 @ 15/6; Bessemer steels, 15/ @ 15/1 IC; Siemens steels, 15/6 @ 16/

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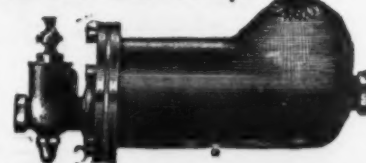
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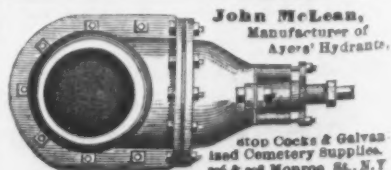
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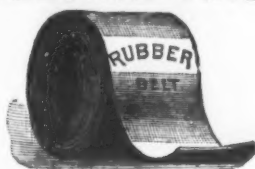
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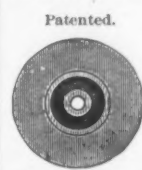
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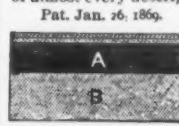
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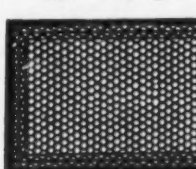


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IC. Charcoals vary very much as to basis price in accordance with the specification. The figures may be said to be 17/10 @ 13/6 IC. Coke tin wasters in ordinary kinds are in good demand at 13/6; others 13/9 @ 14/10 box.

THE HARDWARE TRADES.

In London there is undoubtedly more life and vigor in business than has been felt for some time past, and a gretty general feeling prevails that when the elections are over we shall have an improvement in trade. A leading member of the hardware trade, who has had a lengthened experience of the metropolis, declares that the conditions are tending toward a prosperous state of trade. At Birmingham, in view of the near approach of the electoral campaign, which will inevitably cause a great interference with trade in all parts of the country, both factors and manufacturers are pushing forward in anticipation of probable requirements, and there is pretty steady employment now in most of the staple branches. In the export department some pressure is still being used to complete heavy shipments for Russia and Canada in anticipation of the close of the navigation, but the shipping trade as a whole is in a declining way, and even the promise of improvement lately noted in the case of the United States has not been maintained. On home account business continues to make slow but steady progress, the demand running principally upon bedsteads, brushes, gas-fittings, lamps, forks and spoons. At Wolverhampton orders are being pushed forward on account of the Dominion and Northern Europe, as the ports will soon be closed by ice. A later vessel than usual will this year start for the St. Lawrence in the hope of getting in, but it is not worth while postponing shipments to the last boat if the risk can by any means be avoided. To the Baltic shipments can be made later than to Canada, but as to this market there is not much time to spare. Concerning the other export markets merchants do not speak with much satisfaction. At Sheffield such expansion of business as is taking place in local industries continues to be confined to the natural development of the season trade in light finished goods. The metropolitan orders are generally described as improving, and some of the leading cutlery-houses report themselves fairly busy, making allowance for the continued scarcity of export business. Table knives are the most conspicuous among the items in request, scissors, razors and pocket cutlery following next in order of prominence. There is a steady increase in the demand for hot-air stoves and heating apparatus generally, but the general condition of the stove-trade remains unchanged, except for the worse, consequent on the lapse of the summer trade. The silver and electroplate firms are rather better employed, but mainly in home orders, which gradually increase with the progress of the season demand. In the export department there is no clear indication of improvement in any direction. American orders continue light, notwithstanding the approach of the period when additional business is usually looked for. Canadian advances afford but small encouragement, and the general Colonial demand is below the average.

Ingenious Device for Facilitating Correspondence.

Every one who has occasion to write a letter or postal card away from his office or out of business hours, when the usual sources of writing material and stamps are not available, has experienced the annoyance of searching for the necessary articles, and knows how embarrassing it is to solicit the supplies from those who are not regularly engaged in the business of supplying them. Annoyance of this kind is frequently experienced by travelers who desire to write a note while waiting for a railway train, also by people who, owing to some emergency, have occasion to write notes late at night or on Sundays, when stores are closed. In the cities it is quite common nowadays for drug stores, which come as near to being open at all times and seasons as any business places, to keep a small quantity of stationery and postage stamps on hand to supply such wants as we have named, not for the profit to be made out of the transaction, but simply as an accommodation to the patrons of the place. Even this, however, does not meet the demand in all respects. A company with a novel purpose in view has been organized in England, the object of which is to meet wants similar to those above described. They are known as the Post Card and Stamped Envelope Public Supply Co., Limited. They are to operate under certain patents for the sale of prepaid goods, the principal features of which are free-delivery boxes.

Devices of this kind were exhibited at the Inventions Exhibition, and also have been at work for some time in London at the principal railway stations. The apparatus consists of a box in which a number of post cards and stamped envelopes are placed. On a penny being dropped into one of the slots at the top of the box the lock is released, and allows the operator to pull out a drawer which brings with it one post card; or, on 2 pennies being dropped into two other slots in the box, a stamped envelope and sheet of paper is delivered. The top of the box forms a desk on which to write. When the box is empty notice thereof is given by a plate rising, with the word "empty" engraved on it, and at the same time the apertures for coin close. According to one of our English exchanges, the "shop" above described costs less than £5 to make, and, according to an estimate we have seen, will, if it sells only two stamped envelopes and five post cards each day (thus receiving 9d. in all), earn sufficient money to pay all expenses of the proposed company and a dividend to the shareholders of 14 1/2 per cent. per annum on their investments. The late Professor Fawcett, when in office as Postmaster-General, promised the owners of the patents that in any case in which there was not a post-office letter-box within easy reach of these boxes one should be placed whenever the correspondence proved sufficient to justify it. Our exchange, in completing the account, says that the day is

LATEST LEGAL DECISIONS.

AUCTIONEER—PRINCIPAL NOT DISCLOSED.

W. had in his possession personal property under a lease or hiring, and he sent it to the warerooms of an auctioneer to be sold. It was sold by the auctioneer without disclosing the name of the owner, and the purchaser was compelled to give up the property in an action of replevin, whereupon he sued the auctioneer for the amount he had paid him at the sale, and recovered judgment. The case—Lemuller vs. Fuchs—was carried to the Court of Appeals of Maryland, where the judgment was affirmed. Judge Robinson, in the opinion, said: "We take the law to be well settled that he who sells property as an agent without disclosing his principal binds himself personally. In such cases the purchaser has the right to rely upon the responsibility of the agent by whom the sale was made, and is not obliged to rely upon the responsibility of an unknown, and perhaps irresponsible, principal. The same rule applies to sales by auctioneers. We are clearly of the opinion, both on reason and authority, that if a sale is made by an auctioneer without disclosing the name of the owner of the property, and it is afterward taken from the purchaser by one who had a superior title, he may recover from the auctioneer the amount he has paid him as money had and received to his use. There is certainly no hardship in this rule of law, because the auctioneer knows the person on whose account the goods were sold, and has it in his power to protect himself against loss. Any other rule would not only be a fraud on purchasers, but destructive of all confidence in auction sales."

CHECK—ASSIGNMENT OF FUND.

Checks were drawn on his bank account by a merchant whose account was attached before the checks were paid, and in a suit brought by the National Bank of America vs. Indiana Banking Co., the main question was whether these checks should be paid. In this case the Supreme Court of Illinois decided that the checks operated as an Assignment of the deposit to the extent of their amount. Judge Scott, in the opinion, said: "When a depositor draws a check on his banker, who has funds to an equal or greater amount, it operates to transfer the sum named in the check to the payee, who might sue for and recover the amount of it from the depository. The transfer of the check carried with it the amount named in the check to each successive holder. After the check has passed to a holder in good faith for value, it is not in the power of the drawer of the check to countermand the payment of it. The legal effect, therefore, of drawing these checks before the notice of attachment was served on the bank was the reduction of the amount of the deposit by the sum of the checks, so that the attachment reached only the reduced amount. It is objected that as the checks were drawn in Illinois, but on an Indiana bank, it being the law of Indiana that checks do not affect an assignment of a deposit to their amount, the Illinois rule does not apply; but the contracts set up by the checks were made in Illinois, and they must be construed by the law of that State."

I. PROMISSORY NOTE—2. COLLECTION AGENCY.

A mercantile agency took a note for collection, and they sent it to one of their correspondents, who took a new note, which was drawn in blank and indorsed by two accommodation indorsers. The person delivering the note filled in the blanks and added to it: "This note, from and after its maturity, shall draw 10 per cent. interest." On the return of this new note to the owner he refused to accept it, as he was advised that the addition of the interest clause was a material alteration of the note and destroyed the value of the indorsements. He sued the collection agency for the conversion of the old note, on the ground of negligence in their agents in taking the new note after it had been altered with their knowledge. In this case—Weyerhaeuser vs. Dun—the Court of Appeals of New York decided in favor of the plaintiff. Judge Finch, in the opinion, said: "1. This new note is not binding on the indorsers, the alteration being material. When a note is delivered in blank by an accommodation indorser, the amount, the name of the payee, the date and the place of payment may be inserted, but doing this is only filling in the necessary parts of the note, the authority to do which is implied. The form of this note did not indicate that it was to bear interest, and therefore there is no authority given by implication to insert interest. Adding this new obligation vitiated the note and released the indorsers. 2. The collection agency are not insurers of the conduct of their agents, but they were, and held themselves out to be, professional experts in their business. They undertook to make collections at all points in the country through local agents and attorneys whom they represented as skillful and reliable, and therefore they are liable for the negligence of their agents and attorneys."

FIRE INSURANCE.

In a fire policy it was provided that when the mill, which was insured, was idle a watchman should be employed by the assured to look after and protect the property. There was also a provision avoiding the policy upon a change in the possession of property, unless consent was given. It was shown on the trial that a man was employed as a watchman who was working in his own mine six or seven hours during the day, and that at night he slept 900 feet away, and out of sight of the premises insured. The jury found for the plaintiff, and the company carried the case—Wengel vs. Commercial Insurance Co.—to the Supreme Court of California, where they succeeded in reversing the judgment. The Chief Justice (Morrison), in the opinion, said: "1. A watchman, according to Webster, is a sentinel, and a watchman of a building is one who takes care of it during the night. In this case it is clear there was not a proper watchman employed. 2. It was shown that the plaintiff leased the property insured

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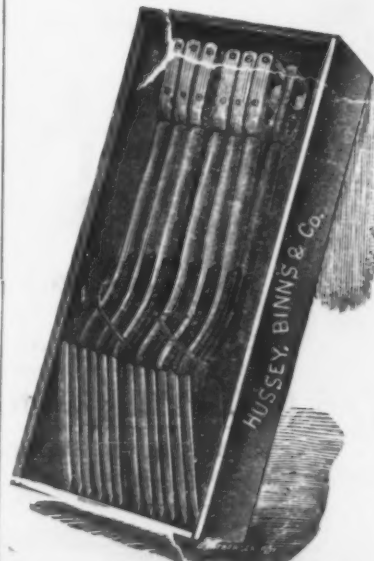
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without the consent of the company, and surrendered possession to the tenant. This was a breach of a condition of the policy by its express terms."

SUING STOCKHOLDERS FOR DEBT OF CORPORATION.

A creditor of a corporation sued a stockholder upon his unpaid assessments, and these defenses were made: 1. That, as the company had not made a call upon the stock, no assessment was due. 2. That the debt was barred by the statute of limitations. The plaintiff had judgment, and the case—Thompson vs. Reno Savings Bank—was carried to the Supreme Court of Nevada, where it was affirmed. The Chief Justice (Belknap) in the opinion, said: "1. It is not requisite that a call shall be made by a corporation before a creditor can sue a stockholder for the company's debt. 2. The unpaid amount on the stock was a part of the capital of the bank, allowed to remain in reserve in the hands of the stockholders, but subject to call when needed. It was a continuing liability of the stockholder which neither the indulgence of the trustees nor mere lapse of time could defeat. The statute of limitations is not available as a defense, because it has not been set in motion by any adverse action, such as a call by the corporation upon the defendant to pay his assessments. If the insolvency of the corporation set the statute in motion, sufficient time had not elapsed when the suit was commenced to bar a recovery."

CONTRACT OF SALE—REFUSAL TO ACCEPT—DAMAGES.

C. sold W. a quantity of brick and part of them were sent in a certain vessel. Part of the brick were delivered, when W. refused to receive the balance. The brick was of the quality called for in the contract, and W. had room for them in his yard. C. made an offer subsequently to deliver the balance, but W. rejected it. In an action to recover damages for this breach of the contract—Canda vs. Wick—the plaintiff recovered a judgment, and on an appeal to the Court of Appeals of New York there was an affirmation. Judge Andrews, in the opinion, said: "The tender and refusal constituted a breach of the contract by the defendant. It was not necessary that the plaintiff should tender the whole of the brick sold, 400,000, to put the defendant in default. It was not intended that they should be delivered in a mass. The right to sue for this breach having accrued, it was not waived, as a matter of law, by a subsequent offer on the part of the plaintiff to furnish the brick, which was not accepted by the defendant until the price in the market had materially changed the situation. As to the damages, these were not affected by the price received from other parties for sales made prior to the sale to defendant, and that the plaintiff had all the brick to fill the contracts, including the contract with the defendant."

"ASSUMING MORTGAGE"—EFFECT OF THESE WORDS.

A purchaser of land on which there was a mortgage took a deed in which there was the covenant: "This conveyance is made subject to a mortgage for \$4000, which the party of the second part assumes, with interest from August 22, 1871." In the action brought upon the covenant to recover the \$4000 thus assumed, the defense was set up that the terms of the covenant did not bind the grantee personally, but the court decided that he was so bound, and the defendant carried the case—Schley vs. Fryer—to the Court of Appeals of New York, where the judgment was affirmed. Judge Earl, in the opinion, said: "The defendant claims that the word 'assumes' is not broad enough to impose a personal liability upon him to pay the mortgage in question. If it had been intended simply to provide that he should take the land subject to the mortgage, the further language in this clause in which the word 'assumes' appears would not have been necessary. Unless that word was used to impose a personal liability upon the defendant to pay, it was wholly unnecessary, and serves no purpose, and adds nothing to the force of the language used. A rule of construction requires us to give force and effect, if possible, to all the language used. That word is frequently used in deeds to impose a liability to pay upon the grantee, and we believe it is generally understood among conveyancers to impose such liability. Such effect has been given to the word when so used in several well-considered cases in other States."

Blacksmith's Hammer Signals.—There are few persons either in the city or country who have not at times watched a blacksmith at work in his shop with his assistant or striker. They have noticed that the smith keeps up a constant succession of motions and taps with a small hand-hammer, while with his left hand he turns and moves the hot iron which the assistant is striking with a sledge. The taps are not purposeless, but given entirely for the direction of the striker. When the blacksmith gives the anvil quick, light blows, it is a signal to the helper to use the sledge or to strike quicker. The force of the blows given by the blacksmith's hammer indicates the force of blow it is required to give to the sledge. The blacksmith's helper is supposed to strike the work in the middle of the width of the anvil, and when this requires to be varied the blacksmith indicates where the sledge blows are to fall by touching the required spot with his hand hammer. If the sledge is required to have a lateral motion while descending, the blacksmith indicates the same to the helper by delivering hand-hammer blows in which the hand-hammer moves in the direction required for the sledge to move. If the blacksmith delivers a heavy blow upon the work and an immediate light blow on the anvil, it denotes that heavy sledge blows are required. If there are two or more helpers the blacksmith strikes a blow before each helper's sledge-hammer blow, the object being to merely denote where the sledge blows are to fall. When the blacksmith desires the sledge blows to cease he lets the hand-hammer head fall upon the anvil and continues its rebound upon the same until it ceases. Thus the movements of the hand-hammer constitute signals to the helper, and what appear desultory blows to the common

observer constitute the method of communication between the blacksmith and his helper.

"Mummies' Eyes" as Jewelry.

At a recent meeting of the Microscopical Society, Mr. G. F. Kunz stated that a necklace was being made by Messrs. Tiffany & Co. of petrified eyes, and that three workmen who were engaged on the necklace had been made suddenly ill, and refused to resume work on such dangerous material. The so-called mummies' eyes are well known, and are, without question, the crystalline lenses of the eyes of a species of cuttlefish (squid). Some of the lenses from the eyes of these cuttlefish measure only 5 mm., but the majority of them are 12 mm. in diameter, and some as much as 18 mm. The color, really only the result of age, is a dark amber yellow, or golden bronze, externally on the convex side. In all cases they are nearly opaque, and have the appearance of an onion-skin or any other sack-like concretion. On the flat side, however, the color is much lighter, and a little play of light is noticeable. The surface is rough, as if an exudation had hardened on it. The structure of the lenses is like that of a pearl—an aggregation of successive enveloping layers, which are marked on the surface by sets of concentric rings. It is also plain, from these rings, that the lenses are sections, constituting only about one-half of the original lenses of the fish, the intention undoubtedly being to produce additional luminous effect by this series of hemispherical reflectors. The crystalline lens of a human eye would not be so large as even the medium-sized lens exhibited, and is so exceedingly delicate that it can only be preserved at all by the greatest care. In many fishes, and especially the cuttlefish (squid), the lens of the eye contains so much solid matter that it will dry up in a short time and with very little contraction into a hard, transparent mass which would probably be durable. On the contrary, Professor Raimondi, the ethnologist of Peru, believes these eyes to be human, and Dr. Tachidi, of Vienna, is said to support him in this theory. The region where these mummy eyes are found is rainless, and the mummies were dried in a sitting posture on the sandy or the niter beds, often thousands of them at one place. This being the case, they must have been exposed to the public gaze, and the embalmers would naturally wish to make the appearance of the dead as attractive as possible. Hence it is probable that the cuttlefish eyes which were inserted into the empty sockets were cut into two nearly equal parts, in order to obtain greater luster, and give a natural brightness to the eyes of their dead.

The three workmen who were engaged in polishing these eyes were all affected soon after working on them. The sawing and polishing were done at different times, and in each case the same result followed, so that the workmen are confident that their illness was caused by the inhalation of dust during the sawing. The youngest, a boy of 16, was taken sick after working only a few hours. His illness consisted of headache, biliousness and vomiting, and lasted for one day. Another workman, a strong, hearty Frenchman, about 45 years of age, and weighing nearly 200 pounds, reported that he was taken sick with nausea, sick headache and vomiting, and noticed a disagreeable metallic taste in his mouth during his entire illness, which lasted four days. The other, a German lapidary, about 40 years of age, was affected shortly after working at the eyes with an eruption of pimples over his entire body, and when any of the affected parts were rubbed a swelling immediately arose. This rash was perceptible for over a month. From the fact that these three cases occurred in one workshop, and soon after work was commenced on the eyes, the men very naturally reasoned that the eyes were the cause of their sickness, and expressed a desire not to resume work on them. In response to inquiry, Professor Baird writes that he never heard that poisonous qualities were inherent in the eyes. If they are really poisonous it surely cannot be from any preparation used to preserve them, for no preservative was necessary, as would have been the case if they were human eyes. It has been observed, however, that in this case certain alkaloids may be generated by the decomposition of the organic constituents of the eyes. The United States Survey chemists are examining the lenses to see what alkaloids, if any, are present. As ornaments these eyes are truly beautiful when the exudation on the cut surface has been removed and they are finely polished. They vary in color from a light yellowish amber tint to a dark yellow, yellowish brown or rich amber brown, similar to that from Catania, Sicily. In some cases the colors are found in alternated bands, as in the Mexican fire opals from Queretaro. Although the reflections lack the play of colors found in the opal, the tints are warmer and more pleasing. The luster on the uncut rounded sides are pearly. With a proper gold mounting these eyes would give a very beautiful effect in jewelry, although moisture would be likely to injure the polish.

The directors of the Brooklyn City Railroad Co. have under consideration a plan for using a cable for the motive-power of surface cars in Fulton street. President Hazard recommends the adoption of a system of twin cables, a few inches apart and joined to each other by steel bars at short intervals. These will make a sort of endless chain of the cable, and the grip-wheel will have projecting cogs, so as to revolve with the cable when the car is stopped, and to draw the car when the motion of the wheel is stopped by a brake.

Sir Nathaniel Barbod, late Director of Naval Construction in England, who is in this country, has expressed some opinions as to the condition of the American navy. He thinks that the United States labors under a disadvantage in not having a sufficient number of shipbuilding establishments, and that the best way to secure experience in construction is to have some ships built in Europe under American inspection. He does not think that the United States have shops enough, and that our naval officers are not sufficiently well trained.

The Iron Age

AND
Metallurgical Review.

New York, Thursday, November 12, 1885.

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Condition of the Blast Furnaces of the United States, November 1, 1885.

We herewith present our usual monthly report as to the condition of the blast furnaces of the United States. At the earnest solicitation of those interested in the production of charcoal iron we have made a change in our reports, and instead of giving, as heretofore, quarterly reports only as to the condition of charcoal furnaces, shall give monthly statements, the same as we have of anthracite and bituminous furnaces. But four furnaces are missing from the report, all charcoal, one each from Minnesota, Texas, Utah and Oregon. These are of so little moment that the report may be regarded as complete.

In a condensed form the table makes the following showing as to the condition of the furnaces November 1, 1885:

Fuel.	In blast.		Out of blast.	
	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal.....	58	8,850	167	15,670
Anthracite.....	86	24,350	136	20,960
Bituminous.....	29	44,101	134	50,616
Total.....	293	76,723	437	96,252

The only change of any moment during the month of October has been a marked increase in the number of anthracite furnaces in blast. On the 1st of October there were 75 furnaces using this fuel reported in blast, with a weekly capacity of 20,318 tons. On the 1st of November 86 are reported in blast, with a weekly capacity of 24,350 tons, an increase in product of nearly 20 per cent. Three of these eleven additional furnaces in blast are New Jersey spiegel furnaces, which were not included in our October report, but, though this reduces the number to eight, it has but little effect upon the capacity, their total output being but 275 tons a week. There has been a slight reduction in the number of charcoal furnaces in blast, but an increase in the weekly capacity, and an increase of one in the number of bituminous furnaces in operation, with a small increase in product.

The number of anthracite and bituminous furnaces in blast at the beginning of each

month of the present year, together with their weekly capacity, is as follows:

1885.	Anthracite.		Bituminous.	
	No. in blast.	Capacity per week.	No. in blast.	Capacity per week.
January 1.....	86	21,564	82	39,812
February 1.....	81	21,180	87	46,053
March 1.....	86	22,889	91	46,774
April 1.....	82	21,704	90	45,675
May 1.....	80	20,729	95	43,397
June 1.....	79	19,894	94	44,498
July 1.....	81	20,444	92	45,945
August 1.....	77	20,530	86	44,845
September 1.....	78	20,190	88	42,603
October 1.....	75	20,318	88	43,284
November 1.....	86	24,370	89	44,101

This indicates a weekly production for the year of 21,242 tons of anthracite iron and 43,871 tons of bituminous, which equals 1,104,584 tons of anthracite iron for the year and 2,281,201 tons of bituminous. These figures are somewhat under rather than over the actual make, but the indications are that the product of 1885 will be less than in 1884.

The World's Merchant Marine in 1885.

The Bureau Veritas has just published its register of all seagoing sailing vessels and steamers for the current year, together with a table showing the changes effected in the number and tonnage of both during the past 10 years. A glance at this table will be interesting just at this time, when the revival of our own shipping industry is becoming a prominent subject of discussion:

Registered Tonnage of Steam and Sailing Vessels in 1885.

Flag.	Sail.		Steam.	
	No.	Tonnage.	No.	Tonnage.
British.....	14,390	4,711,746	4,879	6,464,323
American.....	6,284	4,138,579	3,35	545,197
Norwegian.....	4,086	1,443,741	266	141,452
German.....	2,424	803,611	509	566,097
Italian.....	2,860	848,828	147	301,070
Russian.....	2,159	472,479	10	161,110
Swedish.....	1,997	407,521	311	495,180
French.....	2,173	308,561	505	750,061
Dutch.....	952	277,945	174	214,538
Spanish.....	1,851	272,083	314	333,008
Greek.....	1,303	254,760	65	54,578
Austrian.....	510	309,428	102	138,447
Danish.....	1,150	181,083	177	185,344
Portuguese.....	369	89,019	28	22,593
Turkish.....	415	67,605	14	10,114
Asiatic.....	119	37,282	119	106,342
S. American.....	87	142,062	136	94,100
Sandwich Islds.....	25	5,232	9	4,520
Belgian.....	26	6,707	60	108,307
Roumanian.....	19	3,354	8	1,666
Cent. American.....	187	33,179	25	24,425
Other nationalities.....	551	9,088	35	40,252
Total.....	43,692	12,867,375	8,394	10,309,504

From this table it appears that one-half of the world's tonnage navigates under the British flag, and that next to it comes ours; that next to ours come the three Scandinavian countries, Sweden, Norway and Denmark, with, together, 2,439,271 tons, and that Germany, France and Italy are the countries with the next greatest tonnage. The changes during the last 10 years in the total tonnage have been as follows:

Sailing vessels.	Steamers.	
	No.	Tonnage.
1876.....	52,308	14,558,368
1877.....	51,912	14,799,131
1878.....	49,534	14,317,431
1879.....	49,024	14,109,048
1880.....	48,584	13,872,811
1881.....	49,037	13,911,915
1882.....	48,487	13,789,970
1883.....	48,074	13,647,871
1884.....	44,734	13,010,570
1885.....	43,692	12,867,375

The decrease in sailing vessels between 1876 and 1885 has been 8,616 in number and 1,685,993 in tonnage. The increase in steamers between 1876 and 1885 has been 2623 in number and 4,582,662 in tonnage. It will be seen that the decrease in sailing vessel tonnage has been comparatively small, only 12 per cent., while the increase in steamer tonnage has been enormous, about 80 per cent. During brisk times in the world's trade this extraordinary increase would probably not have influenced freights materially, whereas the dull state of commerce and the depressed prices for nearly everything have seriously affected the earnings of steamers and depreciated this kind of property in common with commodities generally. Sailing vessels are less affected in value and earnings, since they are handier, do not require such large cargoes and are not as ruinous property in dull times as steamers.

The experience of the past few years has demonstrated that those who thought steam would soon supersede sail in ocean navigation were mistaken. At any rate, we continue to keep up our large fleet of sailing vessels remarkably well, and should be able to do so better still if some three years since the differential duty of 10 per cent. against goods from beyond the Cape of Good Hope had not been abolished. The abolition of this duty was evidently a mistake; it was taking away valuable freight from our East Indian and giving it to steamers under the British and Dutch flags now trading via Suez. By abolishing this extra duty we built up the trade of other nations. Tin from the Straits, for example, now goes to London instead of coming direct to New York and Boston, much to the delight of the speculators there, who can manipulate the market all the better and make our consumers pay for it. Not only do our sailing vessels lose the freight on it, but we have driven away the trade from our ports to those of Europe, and whatever we require has to come second-hand from Europe, under foreign flags in foreign steamers.

Our English contemporaries continue to worry over the superiority of some products of American works, and it is now our locomotive which is again troublesome. The Ironmonger quotes from a recent speech by

Sir Julius Vogel, 'New Zealand Minister of Public Works, as follows:

Before leaving this subject it may be desirable that I should refer here to a transaction which has recently taken place with regard to some 20 locomotives which were ordered from England in July and November, 1884, to be delivered for shipment between June and March, 1885. In October last I received a cable message from the agent-general to the effect that two of these engines were shipped, and that they were so heavy that it would be necessary to strengthen all bridges on the lines they were to run upon. On inquiring as to how this could be I found the engines with tenders, as constructed, were 10 tons heavier than they were specified to be. I immediately refused to take these engines, and after a very long and expensive correspondence by cable and letter the contractor, finding that we would not take the engines as built, agreed to alter them in a manner satisfactory to the department at their own cost. These engines as altered are now coming forward. In the meantime, being disappointed in not receiving engines at the time when they were expected, I was obliged to order others, and succeeded in making a contract with the celebrated Baldwin Co., of Philadelphia, to supply 12 engines on the same specifications as those sent to England in 1884. The order left New Zealand on December 6, 1884, and we have had advice of the shipment of the whole number at New York by May 1, 1885—namely, five months from the time of the order leaving here. And a still more satisfactory part of the business is that they will be fully 2400 per engine less than the English ones. As it is evident from our experience in the case of these locomotives, and also from the case of defective axes, which I have already referred to, that the system of inspecting at present in force in England is far from satisfactory, it has been determined by the Government to inaugurate a better system for the future.

To Americans the only significant fact in connection with this statement is that it shows that English builders appear, like the Bourbon family, "to have learnt nothing and to have forgotten nothing." A few years since attention was somewhat forcibly drawn in England to the fact that American locomotive works turn out engines particularly well adapted to Colonial service, and that in conducting such a business our makers deal squarely and promptly. If it is fair to accept the example quoted by Sir Julius Vogel as indicating the principles upon which some of the English works conduct their business, then, indeed, there is cause for alarm. It would prove that competition fails to cause the disappearance of old fogy work and slipshod methods. It will not do, however, for American producers to lull themselves into false security by the contemplation of facts brought out in this way. The best friends of English industry will be most diligent in hunting up such cases, and most emphatic in condemning them. This good object may even lead them to exaggeration. Evidence of this kind is valuable, but it is dangerous to judge from it too quickly.

The September Returns of the Bureau of Statistics.

The September movement of merchandise has not, on the whole, been satisfactory. According to the monthly return by Mr. Wm. F. Switzer, chief of the Bureau of Statistics, the value of the imports for the month aggregated \$50,155,972, against \$51,359,163 during the month of September, 1884. For the first nine months in the years 1885 and 1884 the figures stand \$431,037,740 and \$489,904,127 respectively, consisting of \$291,471,006 and \$339,785,655 of dutiable merchandise, and \$139,566,734 and \$150,115,472 of merchandise free of duty. It will be noted that the decline touches chiefly foreign goods upon which a duty must be paid.

So far as the exports of domestic merchandise are concerned, the falling off in September is far greater. While in that month in 1884 we sent away goods of the aggregate value of \$54,010,415, we shipped only \$46,867,532 in that month in this year. For the first nine months of the years 1884 and 1885 the aggregate value of domestic exports are \$495,422,270 and \$462,409,303 respectively. The heaviest loss is in breadstuffs—from \$115,046,725 to \$104,292,490—and in cotton—from \$111,806,455 to \$88,744,239. Taking merchandise and coin and bullion together, the excess of exports at the end of September stands \$54,107,732 in 1884, against \$52,862,550 in 1885.

Turning now to the imports of iron and steel for the month of September, 1885, and for the first nine months of the calendar years 1884 and 1885, we have:

Imports of Iron and Steel—Gross Tons.			
	Sept., 1885.	Nine mos., 1885.	Nine mos., 1884.
Iron ore.....	\$38,468	\$326,462	\$430,926
Pig iron and cast iron.....	10,494	104,304	148,616
Iron scrap.....	1,807	9,971	19,514
Steel scrap.....	61	1,354	6,354
Iron rails.....	4,063	21,076	27,822
Steel rails.....	50	1,039	2,745
Iron and steel cotton ties.....	8,006	13,576	10,213
Hoop, band and scroll iron.....	92	138
St. ingots, blooms, slabs, billets & bars.....	130	924	1,084
Sheet, plate and tapers iron.....	1,922	16,886	17,414
Tin plates,terne plates or tapers iron.....	1,688	3,920	4,026
Steel and iron wire rods.....	14,968	177,215	160,372
Iron and steel wire, wire rope and strand.....	7,000	61,231	91,703
Anvils, axes & iron or steel forgings.....	479	1,764	2,038
Iron or steel cutlery.....	86	467	704
Files, file blanks, rasps & floats.....	54	408	725
Firearms.....	196,901	1,048,939	1,380,767
Machinery.....	5,726	35,844	37,979
Needles.....	130,078	616,378	1,133,714
All other manufactures, n.e.s.....	29,585	632,323	855,031
Total value of imports of iron and steel.....	\$3,588,800	\$28,005,000	\$28,729,735

Except in the case of tin plates and cotton ties, the quantities imported show a decline throughout. The imports of tin plates account for nearly one-half of the total value, having been \$13,201,039 in the first nine months of 1884, and \$12,386,713 in 1885. The figures show that there has been a fairly large growth in the consumption, more than offset by a decline in price. The next heaviest item is that of wire rods, valued at \$3,342,421 in the nine months of 1884 and only \$1,948,270 in 1885, followed by pig iron with \$2,615,561 and \$1,830,893, respectively. Among the other articles the imports of which are valued at more than \$1,000,000 in either of the years, we may enumerate ore, in 1884, \$1,000,956—in 1885, \$649,811; bar iron, \$1,195,388 and \$669,294, and steel ingots, billets and bars, \$1,039,932 and \$809,533. It will be observed that in all of these items there has been a decline, which must be principally attributed to the successful competition of home manufacturers.

Among the imports of metals and manufactures of metals we note the following:

Imports of Metals.			
	Sept., 1885.	Nine months, 1885.	Nine months, 1884.
Tin, gross tons.....	1,045	7,494	7,918
Copper ore, fine copper contained, net tons.....	126	1,356	989
Pig and old copper, net tons.....	14	281	56
Spelter, net tons.....	57	1,041	1,695
Brass and manufactures of brass.....	\$35,800	\$205,967	\$302,467
Clocks and parts of clocks.....	53,702	300,909	332,132
Man's of copper.....	5,737	63,636	178,068
Lead and manufactures of lead.....	32,215	477,000	447,170
Bronze man's.....	55,199	406,353	449,473
All other metals, metal composites and manufactures.....	196,862	1,081,087	1,224,246
Man's of zinc.....	2,303	25,259	80,812

Small quantities of a number of the articles enumerated are re-exported. In some instances exports of domestic merchandise of the same character are much larger than the imports of similar goods from abroad. A glance at the following tabular statement will illustrate this:

Exports of Metals.			
	Sept., 1885.	Nine months, 1885.	Nine months, 1884.
Copper ore, tons.....	1,908	26,737	25,969
Refined copper, net tons.....	2,091	15,144	7,392
Quicksilver, lbs.....	30,319	388,073	428,162
Brass, man's.....	\$11,745	\$76,908	\$397,667
Clocks and parts of clocks.....	38,321	316,534	300,061
Man's of copper.....	18,331	94,960	75,784
Man's of lead.....	8,146	75,654	110,637
Plated ware.....	37,619	311,346	370,800
Man's of tin.....	8,472	104,169	119,499
Man's of zinc.....	1,586	10,069	10,465

We note these figures to show clearly how great is the discrepancy between our exports of raw material, such as copper and copper ore, valued in the first nine months of 1885 at no less than \$6,299,201, while the exports of finished articles from the same metal are so very small.

Our exports of manufactures of iron and steel have fallen off considerably, being only \$11,312,849 in value in the first nine months of 1885, as compared with \$14,770,816 last year. The following are among the leading items:

Castings.....	51	408	725
Parts of machinery.....	186,901	1,048,598	1,380,767
Locks, hinges and builders' hardware.....	3,726	85,584	35,979
Tools.....	130,078	616,378	1,138,714
Machinery.....	59,585	632,912	855,661
Other manufactures.....	28,289	247,475	288,111
Total, n.e.s.....	108,063	1,087,261	1,538,241
Value of exports of iron and steel.....	\$4,588,850	\$26,065,000	\$28,729,735

The Exposition at New Orleans, which may be said to be a continuation of the World's Centennial, held in that city last winter, was opened on Tuesday with imposing ceremonies. The new organization consists of 16 members, nine of whom are prominent local merchants and the remainder representatives of States. The president is S. B. McConnoico and Col. J. W. Glenn, Director General. Already about one-half the space in the building is covered. A few of the States have their exhibits almost completely installed. Others are rapidly being prepared.

THE WEEK.

There is great discontent among the merchants of Colon and Panama, caused by an edict from President Nunez, of the United States of Colombia, declaring that after December 1, 1885, all imports into the ports of Colon and Panama will be subjected to tariff duties similar to those now imposed upon imports in other ports of Colombia, but with a reduction of 40 per cent. The tariff of the United States of Colombia requires the certification of all invoices before a consul of that country in the foreign ports of origin, and all dutiable articles are classified and assessed at a fixed rate per kilogram for the article of each class.

Work in the Morgan Iron Works, in this city, and in the John Roach Shipyards, of Chester, Pa., was resumed on Monday. The opening of the works is the result of an arrangement between the Secretary of the Navy and George W. Quintard and George E. Weed, assignees of John Roach, for the completion of the new Government cruisers. The work will be done by Assignees Quintard and Weed, under the supervision of a staff of engineers, who in turn will be under the direction of the Advisory Board, the Board of Steam Engineering and the Board of Construction. The workmen will be employed directly by the assignees, and will be selected for considerations of their fitness only. What the assignees will do with the works after the cruisers are finished is a matter of conjecture.

Montreal is expecting to realize substantial advantages from the "new feeder"—that is, the Canadian Pacific Railway. Montreal becomes practically the eastern terminus and shipping port of the main trunk line serving the Western provinces and territories of Canada, as well as of whatever traffic there may be now or in the future with Asia. The natural advantages that Montreal possesses in being at the head of ocean navigation are increased by the several lines of the Canadian Pacific Railway making that city a common headquarters.

John Cardwell, of Georgia, the newly appointed United States agent and consul-general to Egypt, was educated in Pennsylvania and graduated from the University of Virginia. He has traveled extensively. As a resident of Texas during many years Mr. Cardwell has done much to improve methods of agriculture. His plantation in Wharton County is one of the best in the Lone Star State.

Gen. Lew Wallace is said to have a torpedo which he wishes to dispose of to his friend, the Sultan, in competition with Colonel Berdan, who is also in Turkey on a like mission with his own invention.

The Fifth Enslage Congress will be held at the Grand Central Hotel, this city, January 20th.

A dispatch from Montreal says that the contract for building the Canada Pacific Railway bridge at Lachine has been awarded to Robert Reid, of Guelph, Ont., who built the International Bridge over the Niagara River. The tender amounted to \$3,000,000.

Throughout California the experimental culture of cotton and tobacco has proved successful.

A careful estimate of the population of Southeastern Alaska by Governor A. P. Swineford places the number of whites at 1900 and natives at 7000. The native Alaskans are said to be educated to some extent in the elementary branches, and to be members of the Greek, Presbyterian and Catholic churches. They are not Indians, and differ in appearance, habit, language and in other respects from the Indians of the United States. The Governor dwells at length upon the great natural resources of Alaska, and severely arraigns those Government agents who have represented the country as inclement to a degree that precludes the cultivation of crops or the keeping of domestic animals. Nowhere, says he, in his home travels from Lake Superior to the Gulf of Mexico has he seen a more luxuriant vegetation than in Southeastern Alaska. The hardier vegetables all grow to maturity and to enormous size, and the cattle are sleek and in the best possible condition.

The customs officers at Montreal have seized some bar steel which was cut in small lengths and entered as scrap. Two of the firms who imported it have made a compromise by depositing double duty, and a third firm will do so, awaiting instructions from the Government.

On account of the successful competition of American manufactured cotton in China, consuls of Great Britain in all the treaty ports are now sounding an alarm in the ears of the cotton-mill owners of Manchester. American cottons are too dear to suit the Chinese peasant, but he has found that English goods stiffened with sizing are dear at any price. The English consuls write that the American cloth is popular because it is very durable, and that the native Chinese cottons outwear three or four English fabrics.

A fire-engine made in England in 1748 for a company in Salem, Mass., is now in the same condition as when purchased, and is the only one of its kind extant. It is not more than 4 feet in length and but little more than 2 feet wide. It is a trough on

wheels. The wheels are sawed from a solid log of wood, and shod with heavy iron. The handles at the top were used to lift it around when it was necessary to change the direction of its progress. The square structure rising from the trough contains the concealed machinery of the pump, with which the arms are connected. The handles, attached at right angles to the arms, are made long enough to accommodate five men at each side. The pipe was screwed on to the top of the pump or air-chamber to give the necessary direction to the stream.

The United States is the greatest cattle-growing country in the world. On farms there are now about 42,000,000; on ranch and range property west of the Mississippi about 10,000,000 cattle graze.

The work of building a breakwater at Laguayra, on the coast of Venezuela, a few miles from Caracas, is to be commenced at once. The entire breakwater will cost \$40,000,000. Blocks of concrete weighing 500 tons each will be laid in the sea. No money will be taken from the public treasury. The London company agree to accept a certain sum per package for all merchandise going over the breakwater for 99 years.

Work on the erection of the Bartholdi Statue will hardly commence before spring. The several parts are sheltered by a large frame building into which the cases have been put. A few pieces are lying outside, including the torch, the feet, one hand and the face of Liberty. The latter, on which naturally the most artistic work has been done, is not incased, and greets the visitor when he first lands at Bedloe's Island.

A sample of India wheat exhibited in Chicago was closely scrutinized. It corresponded with some that was sold in England on the 22d of last month at an equivalent of 89 cents per bushel. "The wheat," says the *Tribune* of that city, "is too dirty to pass here any better than No. 3, but the grain is of fair quality, and it is no wonder if it be preferred to ours at the relative cheapness indicated by the above-named figure."

An immense tract of coal territory in Western Kentucky is being rapidly developed, and is now going into the Southern markets at a lively rate. These coal measures lie along the line of the Louisville and Nashville road, from Livingston, Ky., to Jellico, Tenn., and along the Eastern Tennessee Railroad. The vein is from 3 to 4 feet in thickness, and is of a fine quality, differing in that respect from the coal found in Western and Central Kentucky, which is not of much account.

A newly invented street sweeper is spoken of by Consul Hale, at Manchester, England. It not only sweeps the pavement, but gathers up the sweepings and removes them. With the new machine two men and two horses will be able to do the work which now devolves upon seven or eight men and two horses. The busiest thoroughfares of a great city may be cleaned at almost any time of day, as the whole machine is complete in itself and interferes no more with traffic than the passing of any other large vehicle. Mr. Hale says the streets of Manchester are the cleanest in the world. They are now swept, as are those in most American cities, by machinery.

The Hennepin Canal project was again under discussion at a formal meeting of the commission in Chicago last week, when delegates were present from Iowa, Illinois, Wisconsin, Minnesota, Michigan and New York. It was decided to give the commission the name of Lake Michigan and Mississippi River Canal Commission.

Mexico has under consideration a scheme for importing Chinese labor for the development of her agricultural and mineral resources, native labor being inefficient. The possibility that the Mongolian race may ultimately gain the ascendancy in the Republic seems to excite no alarm.

Pennsylvania pilots will be exclusively employed on the iron-ore steamers plying between Philadelphia and Santiago, Cuba, in the future, by order of the charterers. The pilots will remain on board the vessels during the voyage.

One of the wells recently drilled at Findlay, Ohio, for natural gas has been "torpedoed." A stream of oil shot 8 feet in the air and the well is now flowing at the rate of 300 barrels per day.

The taxable valuation of New Jersey for the present year is fixed at \$565,500,687, which is an increase of \$56,608,319 compared with 1879. The increase in Hudson County compared with 1884 is \$3,372,000; Essex County, \$2,760,000.

The English court in Yokohama decides that the owners of the British steamer *Glamorganshire* are liable for \$100,000 loss, resulting from collision with the American ship *Clarissa B. Carver*, near Kobe, several months ago.

Lieut. Arthur L. Howard, of the Gatling gun organization at New Haven, has gone to Canada, and will locate a firearms and cartridge factory for the Dominion Government near Ottawa, and next spring will take the management.

Corporation Counsel Lacombe, in response to a communication of Commissioner Squire asking advice as to the requirements of the amended law of the State relating to the

"telegraph pole nuisance," says the Commissioner of Public Works is relieved of any duty in the premises. The Board of Commissioners for this city consists of Messrs. Loew, Moss and Hess. The first named is chairman of the board, while Theodore Moss is the secretary and treasurer. Speaking of the letter and the work of the board, Mr. Moss says that by next spring the board will have fixed upon a definite plan for laying down electrical subways, so that during next summer the plans may be put into actual operation. "We have had every encouragement, not only from the public, but from the companies themselves, who are anxious to have the underground plan carried out, as a matter of economy in the long run. Having fixed on a plan, the law under which we act gives us full authority to compel its adoption by all who use or wish to use the streets for carrying electric wires of any kind. We are not bound to any time in which to reach a conclusion, but are working on with due diligence, and I do not think a single day has been wasted since we started in. If by a year from this time the streets are comparatively clear of the wire nuisance I think the public will be satisfied that we have not frittered away our time."

The United States mail steamship line to Brazil has been extended to Santos, and will hereafter connect at Earbadoes with steamers for Colon and for British, Dutch and French Guiana.

The Canadian steamer *Quebec* has been raised from a depth of 134 feet in Lake Superior.

The question of building the new ships authorized last spring by Congress is now being considered, and designs upon which specifications are to be based preparatory to inviting bids from shipbuilders will soon be ready for presentation.

Contracts for the construction of a tunnel nearly 2 miles in length on the Cascade Range will shortly be awarded by the Northern Pacific Railroad Co. The cost will be about \$750,000. After it is built the trains of the company can run over their own road through to Tacoma, on the Pacific Ocean, and there will be a chance to develop the valuable coal beds which are known to exist in the Cascade Mountains.

General Newton, in his report on the improvement of the Hudson River, says that in 1870 the available channel between New Baltimore and Albany was but 4 feet in depth. Through the adoption of longitudinal dykes by the Federal engineers the depth has gradually increased, until now there is a channel over 10 feet deep at low water up to Albany, and more than 8 feet between Albany and Troy.

Speaking of steam yachts, a New York letter writer says: "The steamer *Rahda*, which Pierre Lorillard built at such expense, has proved a very unlucky vessel. She cost her builder a lawsuit and heavy damages for a collision, and then he sold her at a great loss. The present owner has been obliged to make extensive alterations, and she is now stripped and laid up. The *Yosemite* (likewise a steamer) was sold to a Central American amateur, but he appears to be short of funds, and hence the transfer has not been consummated. There is now an unusual number of sailing yachts in the market, as steam is now coming into general use. The *Atalanta* is, of course, the finest vessel of this kind, but is of little benefit to its owner, and is now laid up for the winter. The interest on the investment and expenses of sailing this vessel are not less than \$20,000 a year, which is rather a large item for a few weeks' service."

At Auburn prison alone there are 630 idle convicts, who are represented by the warden to suffer both morally and physically in consequence.

The annual report of the New York Produce Exchange shows that the exports of breadstuffs and grain from this port in 1884 were equal to 64,688,691 bushels, being more than one-half the quantity exported from all Atlantic ports. In regard to the rates of inland transportation the report says that both by rail and water routes for the last three years these rates have been cheaper than ever before.

It is a happy circumstance as concerning labor disturbances that the dynamiters in St. Louis, who sought to identify themselves with the car-strikers and to champion the cause by blowing up vehicles, have been promptly repudiated by the Knights of Labor and their acts condemned. After an investigation of the facts the National Executive Board, including Mr. Powderly, satisfied themselves that the men who had used dynamite acted without the authority of the Assembly, and relieved the order of all responsibility by expelling the accused men from the organization.

A new organization has been formed for the study of political economy, the foundation of which is the relation of labor to labor's accumulations, generally called capital. The new society have adopted the title of the American Economic Association, and are composed of the teachers and philosophers of our colleges. Among the officers are: President, Francis A. Walker, LL.D., Massachusetts Institute of Technology; first vice-president, H. C. Adams, Ph.D., University of Michigan and Cornell University; second vice-president, Edmund J. James,

Ph. D., University of Pennsylvania; third vice-president, John B. Clark, A. M., Smith College; secretary, Richard T. Ely, Ph. D., Johns Hopkins University, Baltimore.

A statement has been made showing the falling off of the trade between Baltimore, the West Indies and British Guiana during the past 10 years, and the almost total suspension of the sugar and molasses trade. The value of those products imported into Baltimore in 1874 was \$10,593,227, while for 1884 the aggregate was \$107,041. The exports from Baltimore in 1874 to those points were valued at \$2,600,189, while in 1884 they reached only \$473,561. There is now a movement to re-establish the sugar refineries, and if possible to recover this lost trade.

A Hankow, China, letter of October 1 says of the new tea crop: "It is becoming more evident each year that the dispatch of fast ships and the rivalry over the first crops is a losing transaction. For some years it is doubtful if any of the firms here, except the Russians, have more than covered expenses. Since the announcement of peace all prophecies have for their burden the revival of business, but the fulfillment is still delayed."

The new screw iron passenger steamer *Sarah A. Jenks* was built at Marcus Hook by Joseph Kidd & Co. She is built for the Sing Sing route, and is 140 feet long, 26 feet beam and 8 feet 6 inches deep. On a draft of water of 6 feet she will carry 150 passengers and 200 gross tons of dead weight. She is fitted with tanks in her extremities that when filled with water will sink her some 2 feet and thereby increase the efficiency of her screw propelling wheel. Her engine is of the compound type, having 16 and 32 inch cylinders, with 24 inches stroke of piston, and the boiler is of steel.

The Panama *Star* and *Herald* of the 7th inst. says a distinguished party consisting of the director of the canal company, Mr. Adamson, the American consul; M. Laville, the French consul; Mr. Beach, American consul at Guayaquil; Captain Lull, of the United States steamer *Hartford*, and Messrs. Nathan Appleton and Slaven have visited the entire line of canal dredging from Colon to Gatun and beyond. All the members of the party were much impressed by the work done.

A wrought-iron pipe, 6 inches in diameter, will be laid by the Independent line within the next two months, to connect the Franklin oil field in Pennsylvania with New Castle Junction, 86 miles separate. The National Tube Works, of McKeesport, expect to secure the contract.

The Supervising Inspector General of Steam Vessels reports the work of the Steamboat Inspection Service for the fiscal year ending June 30, 1885, as follows: In the domestic service.—Total number of vessels inspected, 5638; total tonnage of vessels inspected, 1,093,365.65; total number of officers licensed, 25,235. The receipts were: From inspection of steam vessels, \$98,851; from sales of licenses, \$12,617. Total, \$111,468. The total number of lives lost by accidents from various causes during the year was: From fire, 1; explosions or accidental escape of steam, 41; collisions, 11; snags, wrecks and sinking, 21; accidental drowning, 55; miscellaneous causes, 4. Total, 133. The loss of life on steam vessels for the fiscal year is the minimum loss yet recorded, being but 1 to each 43 steamers inspected, as against 1 to each 3 steamers inspected the year previous to the steamboat law of 1852.

President Cleveland's efforts to promote a bi-metallic union with the leading nations of Europe now become publicly known for the first time through a report made by Manton Marble to Secretary Bayard, giving the results of a confidential mission in which the ex-editor has been employed for the last five months. Meanwhile Mr. Marble has had personal conferences with the leading economists and monetary experts of the three great powers of Europe, including all the principal metallists and also the foremost leaders of the opposition in England. A formal report on the general subject will be presented at the coming session of Congress.

The estimates just passed by the Russian Government for 1886 indicate a vigorous naval policy. An expenditure of \$6,000,000, or about three times the ordinary amount, is provided for. Of this \$4,500,000 will be devoted to the building of hulls, and of this \$3,000,000 will be assigned to private establishments and the remainder to the Government yards.

A municipal census of Kansas City, Mo., just completed, shows that city's population, exclusive of the suburbs, to be 105,042. This indicates a gain of about 50 per cent. since 1880.

The competition of sailing vessels in bringing coal from Tacoma, on Puget Sound, to San Francisco is given as a reason for laying up the iron steamship *San Pedro*, which has been engaged in that traffic. The *San Francisco Bulletin* conjectures the real reason to be the large decrease in the consumption of coal for steam purposes, occasioned by the substitution of petroleum.

The copper bullion product of Arizona exported last year is valued by Governor Tritt, in his report to the Secretary of the Interior, at \$2,750,000, and the yield of 1885 will be equally large. Cattle raising is as-

suming an importance second only to mining among the industries of the Territory. An appropriation for sinking artesian wells is recommended, with a view to the reclamation of sterile lands, the reservoirs to be placed in positions to be determined by a hydrographic survey. The population of the Territory is placed at 80,000, and the value of assessed property at \$25,000,000.

The Mayor of Tacoma, Wash. Ter., one of the local judges and a newspaper editor are among several prominent persons who have been indicted for complicity in forcibly expelling the Chinese population and in some instances destroying their property. A proclamation by President Cleveland authorizing the employment of military force "to suppress domestic violence and enforce the faithful execution of the laws of the United States" was immediately followed by a restoration of order, and there is reason to believe that for the present at least the anti-Chinese agitation on the Pacific Coast is at an end. Troops are now en route for Seattle, and the District Attorney will lose no time in bringing the rioters to trial.

The report of the Lighthouse Board recommends that an appropriation of \$60,000 be made for the building of a steamer to be used by the lighthouse service in the Fourth District, and of \$150,000 to enable the board to build a new supply steamer. The substitution of mineral for lard oil in the lighthouse service is about completed.

Hon. Leverett Saltonstall was appointed Collector of Customs at Boston, in the place of Roland Worthington, removed.

A new submarine cable laid across Vineyard Sound last Monday will prove a valuable auxiliary to commerce.

A strike threatening serious results was ordered at Galveston on the 3d inst., in consequence of the refusal of the agent of Mallory's steamers to withdraw colored longshoremen who claim the protection of an existing contract for their labor. The question in dispute was referred to an arbitration committee, but the colored men thus far tenaciously hold to their alleged rights, and feeling between the hostile parties runs high.

It is affirmed that the recent election in Connecticut was controlled by the Knights of Labor, who resented the action of the Governor in appointing a college professor to the head of the Bureau of Labor Statistics, and that a new power will hereafter make itself manifest in the Naugatuck Valley and other centers of manufacturing.

The steel steamer *Algoma*, built on the Clyde at a cost of \$450,000, was wrecked in Lake Superior on Saturday night and 37 lives were lost. She was purchased two years ago by the Canadian Pacific Railroad Co. for lake traffic.

A prominent St. Paul railroad official, recently speaking of prospective railroad-building in the Northwest, said no one had any idea of the immense amount of work of this description which was proposed for the near future. Profiles have been drawn and specifications made for upward of 5000 miles. Most of this, it is said, will be built next year. The building of the immediate future will be confined mostly to the construction of branches for feeders to the existing roads.

Franklin B. Gowen has issued an address to the stockholders of the Philadelphia and Reading Railroad Co., asking them to restore him to the presidency of that corporation. He asserts that in 1884 the company lost \$2,000,000 by unnecessary idleness which was submitted to by the receivers at the demand of the New York companies. He proposes, if elected, to apply to the courts to give to the shareholders some control in the receivership. He promises to reorganize the company and reduce their fixed charges; to adjust their difficulties with the New Jersey Central Railroad; to take prompt measures for the construction of the South Pennsylvania Railroad, or, if that be found impracticable, open a line in competition with the Pennsylvania line by connections with the Baltimore and Ohio Railroad Co.

Satisfactory experiments appear to have been made in France with a new kind of telegraph wire, among the advantages of which, as claimed, is a less degree of conductivity than that in ordinary use, with a considerably higher tensile strength, thus allowing the wire to be more tightly strained, while the posts may be placed at greater distances apart. The conductivity is stated at 80 per cent., and the tensile strength varies from 34.09 to 36.82 tons per square inch. The inventor in this case has also experimented with a silicious bronze wire especially intended for telephone service, and for which tensile strength is of secondary importance. Of the modified types of this wire, one has a conductivity of 42 per cent. and a tensile strength of about 52 tons per square inch. Another type, intended for wide spans, has a conductivity of 21 per cent. and a tensile strength of some 70 to 85 tons per square inch, being thus peculiarly adapted to a numerous class of cases.

According to reports received by the State Anti-Convict League, there are now 103 convicts at the coal mines in Alabama, to say nothing of the comparatively small squads elsewhere.

Many good miners, with their families, are moving into Blocton, Ala., from Ohio and Pennsylvania.

THE Iron Age Directory

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PAID.

Air Brakes.

Westinghouse Air Brake Co., Pittsburgh, Pa.

Air Compressors.

Clarkson Bros., Brooklyn, N. Y., and New York City.

Norwalk Iron Works, S. Norwalk, Conn.

Alarm Money Drawers.

Tucker & Dorsey Mfg. Co., Indianapolis, Ind.

Anti-Friction Metals.

Reeves Paul & Sons, Philadelphia, Pa.

Avalis, Manufacturers of.

Eagle Anvil Works, Trenton, N. J.

Arms and Ammunition.

J. F. Meacham Arms Co., St. Louis, Mo.

J. F. Meacham Arms Co., Boston, Mass.

Asbestos.

Chalmers-Spence Co., 419 8th, N. Y.

Ash Sifters.

Blanchard's Sons, Porter, Concord, N. H.

Auger Handles.

Mills Falls Co., 74 Chambers, N. Y.

Augers and Bits.

Howard, Childs & Co., Pittsburgh, Pa.

Copper.

New Haven Copper Co., 294 Pearl, N. Y.

Cordage.

Elmhurst Steam Cordage Co., 48 South, N. Y.

Cork Screws.

Howe Bros. & Hubert, West Winsted, Conn.

Cork Presses.

Mechanics Iron Works, Charlotte, N. C.

Coverings, Boiler and Pipe.

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Seidel H. B., Philadelphia, Pa.

Curry Combs.

Lawrence Curry Comb Co., 309 E. 23d, N. Y.

Cutlery, Importers of.

Cutlery, Manufacturers of.

American Cutlery Co., Chicago, Ill.

Dog Collars.

Medford Fancy Goods Co., 101 Chambers, N. Y.

Door Checks and Springs.

Shaw Door Check & Spring Co., Boston, Mass.

Door Hangers, House and Barn.

Cochran Iron Foundry and Machine Co., Cohasset, N. Y.

Drop Forgings.

The Billings & Spencer Co., Hartford, Conn.

Drop Presses.

Stiles & Parker Press Co., Middletown, Conn.

Blanchard's Sons, Porter, Concord, N. H.

Blind Awning Fixtures.

North P. O. & Co., Boston, Mass.

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Boiler Plates.

McMillan W. H., 113 South, N. Y.

Boiler Stacks.

Pope Mfg. Co., 597 Washington, Boston, Mass.

Boiler Taps.

The Seidel & Hastings Co., Wilmington, Del.

Boilers, Steam.

Babcock & Wilcox Co., 30 Cortlandt, N. Y.

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Chains.

Bradley & Co., 810 Richmond St., Phila., Pa.

Chemists.

Wm. H. Haskell Co., Pawtucket, R. I.

Chemicals.

Brainerd A. F., Birmingham, Ala.

Cherry Stokers.

Elmer & Amend, 205 Third, N. Y.

Children's Sleighs, Wagons, &c.

Enterprise Mfg. Co., Philadelphia, Pa.

Chisels, Manufacturers of.

Buck Bros., Millbury, Mass.

Chucks.

Brown R. H. & Co., New Haven, Conn.

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Mfg. Co., 96 Chambers, N. Y.

Coal Vases.

Dunbar Bros., Bristol, Conn.

Coal Vases.

Shepard Sidney & Co., Buffalo, N. Y.

Coffee and Spice Mills.

Enterprise Mfg. Co., Philadelphia, Pa.

Coke.

Lane Bros., Poughkeepsie, N. Y.

Commission Merchants, Iron, Steel.

Schoonmaker J. M., Pittsburgh, Pa.

Copper.

Howard, Childs & Co., Pittsburgh, Pa.

Cordage.

New Haven Copper Co., 294 Pearl, N. Y.

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Glue.

Russett Cement Co., Gloucester, Mass.

Grinders and Polishers' Supplies.

Dibell Mfg. Co., Philadelphia, Pa.

Grinders, &c.

The K. & W. Mfg. Co., Chillicothe, Ohio.

Grindstones.

Beren & Huron Stone Co., Cleveland, Ohio.

Gunpowder, Makers of.

Lafin & Rand Powder Co., 29 Murray, N. Y.

Hammers.

Buffalo Hammer Co., Buffalo, N. Y.

Hammers, Steam.

Beaudry & Cunningham, Boston, Mass.

Hand Force Pumps.

Union Mfg. Co., 103 Chambers, N. Y.

Hardware Commission Merchants.

Field Alfred & Co., 93 Chambers, N. Y.

Hardware Manufacturers.

Enterprise Mfg. Co., Philadelphia, Pa.

Hardware Price Cards.

Root T. W., Detroit, Mich.

Hardware Specialties.

Acme Shear Co., Bridgeport, Conn.

Hinges.

Stanley Works, New Britain, Conn.

Hoses.

Canton Hose and Tool Co., Canton, Ohio.

Hog Ringers.

Chambers, Berlin & Quinlan Co., Decatur, Ga.

Hoisting Machines.

Harrington E. & Son, Philadelphia, Pa.

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Brother John, 81 Murray, N. Y.

Horse Nails, Makers of.

Champion Horse Nail Co., Appleton, Wis.

Horse Shoes, Makers of.

Rhode Island Horse Shoe Co., Providence, R. I.

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Bellevue Iron Works, Buffalo, Pa.

Household Articles.

Maine Mfg. Co., Fairfield, Me.

Hydraulic Jacks.

Dugan Richard, 24 Columbia, N. Y.

Ice-Cream Freezers.

Watson & Stillman, 4708 Grand, N. Y.

Insurance, Boiler.

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron, Manufacturers' Agents.

Cox & Justice, Jr., 508 to 502 Water, N. Y.

Iron, Manufacturers of.

Burden Iron Co., Philadelphia, Pa.

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Keystone Rolling Mill, Ltd., Pittsburgh, Pa.

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Kirkpatrick & Co., Pittsburgh, Pa.

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Nimick & Britton Mfg. Co., Pittsburgh, Pa.

J. E. Quackenbush & Sons, 535 Eighth, N. Y.

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Trade Report.

SCRAP IRON.

their new purchasers, the Gallatin National Bank and Mr. Adrian Iselin. The old bank building will be demolished.

No. 4 Forge 32/
Bessemer Pig.—The market is un-

Manufactured Iron.—The market is irregular. We quote at works :

	£	s.	d.	£	s.	d.
Staff, Ord. Marked Bars...	7	10	0	@	0
" Medium "	6	0	0	@	6	10
" Common "	5	10	0	@	5	15

Tin.—The market is weaker. Straits Tin, spot, is quoted £90. 10/ @ £91, and futures £91 @ £91. 10/.

Tin Plates.—The market is not so steady.

Spelter.—The market is unchanged. We quote Ordinary at shipping ports, £14 @ 14. 5/.

Lead.—Market is unchanged. We quote Common English Pig, £11. 10/.

English. Steep from Glasgow to New

Office of *The Iron Age*,
WEDNESDAY EVENING, November 11, 1885.

strengthening—that the general drift is in the direction of better times. Trade, however, is quiet at the commercial centers and without special feature. Exports of the leading staples continue moderate. At the present slow rate wheat exports for the year are not likely to exceed 42,000,000 bushels, against 85,000,000 bushels last

round recent estimates on this side of the Atlantic. The movement of provisions promises much better, unless checked by the recent sharp speculative advance, which in Chicago on Saturday was 15¢ on pork, and

advanced on reduced crop estimates from the secretary of the National Cotton Exchange, the total yield dropping from 6,000,000 bales and upward to 6,656,000 bales, and is quoted $\frac{1}{16}$ ¢ higher. In manufactured cottons exporters have done considerable business, more particularly for

South America, Africa and China—the total from this port since January amounting to upward of \$9,000,000, compared with about \$500,000 for the same time last year.

On the Stock Exchange speculation runs wild. The advance toward higher prices meets with only an occasional check, due to realizations by several of the bull pools. Meanwhile the negotiations designed to maintain tariff rates among the trunk lines have been "worked for all they are worth," and now it appears that little remains to make

Thursday was followed by raids on Fri-

y, which had an unsettling effect. On
aturday the fact of an agreement of the
unk-line presidents was announced, but
e statement that the Baltimore and Ohio
nnection with New York had not been
ranged caused a weakness in Jersey
entral, and St. Paul declined heavily.

d. On Monday prices were irregular, b

generally downward. On Tuesday, before at intervals, there was a disposition to unload, but prices as a whole advanced, and to day the market was strong and active. Quotations as follows: Canadian Pacific, 53; Central Pacific, 47½; Mackawanna, 120½; Erie, 23½; preferred,

1875

Trade Report.

New York Iron Market.

Pig Iron.—The market has been quiet, with a fair volume of transactions for early delivery. The feeling is one of confidence in the future, and leading makers are not yet naming prices for next season's delivery. The opinion prevails that if any advance is made it will leave No. 1 Foundry Iron untouched, and will refer to No. 2 X and Gray Forge only. The difference now prevailing between No. 1 X and No. 2 X is certainly too great when relative quality is considered. We quote standard brands of Lehigh and North River Irons, tidewater delivery, nominally as follows: No. 1 X Foundry, \$18 @ \$18.50; No. 2 X Foundry, \$16 @ \$16.50; Gray Forge, \$15 @ \$15.50; the outside figure is asked for special brands. Outside brands sell for 50¢ @ \$1 less than our quotations. We print elsewhere our monthly blast furnace returns, which will be found of special interest as affecting the anthracite furnaces.

Scotch Pig.—The market is quiet and dull, with prices steady. We quote nominally as follows for round lots: Coltness, \$19.50 @ \$19.75 to arrive; Gartsherrie, \$19.50 to arrive; Shotts, \$19.50 @ \$19.75 to arrive; Carnbroe and Glengarnock, \$18.50 to arrive; Summerlee, \$19 @ \$19.25 to arrive; Dalmellington, \$18 @ \$18.50 to arrive; Eglinton, \$17.50 @ \$18 to arrive, and Clyde, \$18 @ \$18.50 to arrive.

Spiegelisen and Bessemer Pig.—Nothing of any consequence has been done in Bessemer Pig this week. In Spiegelisen negotiations are pending for contracts for spring delivery. We quote \$25.75 @ \$26 for early delivery, 20% Spiegelisen, with the market firm.

Bar Iron.—The market occasionally shows some irregularity. We quote for delivery here in round lots: Common Iron, 1.45¢ @ 1.55¢; Medium, 1.55¢ @ 1.65¢; and Refined Iron, 1.75¢ @ 1.9¢, with half extras. Store prices are 1.6¢ @ 1.75¢ for Common, 1.75¢ @ 1.8¢ for Medium, and 1.9¢ @ 2¢ for Refined.

Structural Iron.—The season for contracting for large buildings is approaching a close, and only small lots of Beams are called for. In Bridge work there is a fair amount of activity, and negotiations are pending for the New Zealand Bridge contract. Angles may be quoted nominally 1.95¢ @ 2.05¢, delivered, for round lots, and Tees at 2.25¢ @ 2.4¢. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Plates.—The market has not gained in strength. We quote for round lots: Common or Tank, 2¢ @ 2.1¢; Refined, 2¼¢ @ 2½¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4½¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2¼¢ on dock; Boiler, 3¢ @ 3¼¢ for Shell, 3½¢ @ 4¢ for Flange, and 4¢ @ 5½¢ for Extra Flange and Fire-Box.

Merchant Steel.—Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7½¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2¼¢ @ 2½¢; Open-Hearth Machinery, 2¼¢ @ 2½¢, and Bessemer Machinery, 2¢ @ 2½¢; English Tool, 13½¢ @ 15½¢; Common grades, 7¢ @ 9¢.

Steel Rails.—The market has been very widely misrepresented by interested parties, and a good deal of sensational reporting has been indulged in. The facts obtained from the most reliable sources are these: Up to November 1st the Rail mills had booked an aggregate within a few thousand tons of 400,000 tons of Rails for 1886 delivery, that being the result of the returns to the Board of Control. Since then Eastern and Western mills have closed between 75,000 and 100,000 tons more, and, with the inquiries in the market, it is likely that, before the week is ended, fully, if not more than, 500,000 tons will be on the order-books of the mills. During the past week there have been sales to Southern roads aggregating about 20,000 tons. Of these one is for prompt delivery of a small lot at \$32 at tidewater; another, a larger lot, for 1886, at the same figure, and one lot of 10,000 tons for a Florida railroad at \$34 at tidewater. The latter sale has been widely quoted as proving a large advance in Rails. It is, however, to a receiver, and it is likely that the conditions of sale are such that it is not a fair test of the market. This is shown by the fact that the sales alluded to above were made only a day or two before it, and that since then a New England road which was on the market for a small lot did not accept bids equivalent to \$31 at mill. There have been large sales of Rails in the West, two orders alone aggregating 18,000 tons. The bulk of this business has been done on the basis of \$34 @ \$34.50 at Chicago. We quote at Eastern mill \$31 @ \$32, according to conditions affecting point of delivery, &c. The Rail market is firm, with an upward tendency. The Rail Makers' Association are holding a meeting at Philadelphia to-day.

Steel Wire Rods.—With the exception of small lots nothing is doing. Buyers are awaiting developments in the American Wire Association, negotiations pending at the present time.

Old Rails.—With the exception of small lots of less than 50 tons each there have been no transactions. Old Rails have been scarce here, and the only criterion to the values of large lines is furnished by the reports of the sale of a large block of Southern Rails in Philadelphia. That market is generally 50¢ higher than ours.

Scrap.—Only small lots are changing hands. We continue our quotation of \$18 @ \$18.50 from yard for No. 1 Wrought.

Old Car Wheels.—We note a sale of 100 tons of Old Car Wheels, prime makers, at \$16.

Rail Fastenings.—The Spike Association are holding Spikes at 2¢. We quote 2.75¢ for Bolts and Square Nuts; 2.9¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.75¢ for Splice Bars.

Metal Exchange.

The following transactions have been reported as having taken place on the floor of the Metal Exchange:

FRIDAY, November 6.	
10 tons Tin, January	20.05¢
SATURDAY, November 7.	
5 tons Tin, December	20.05¢
MONDAY, November 9.	
5 tons Tin, January	20.00¢
5 tons Tin, February	19.95¢
TUESDAY, November 10.	
10 tons Tin, December	20.00¢

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, November 10, 1888.

Pig Iron.—No special change can be noted in Pig Iron, although the tendency is toward increasing firmness, particularly in Mill Irons. This is something of an anomaly, as there is very little improvement in Finished Iron, either in price or in demand. Still there is no denying the fact that Pig Iron is both scarce and firm, notwithstanding all theories to the contrary. What the ultimate outcome may be is entirely a matter of conjecture, so that anything like confident predictions in times like these would be very unwise. As already stated, the demand for Finished Iron does not fully account for the increased movement in Pig Iron, so that the cause must be sought for elsewhere. A careful survey of the entire subject points to the following as being at least a reasonable theory. For several months, and up to about September, this market was supplied not only with Pig Iron from local furnaces, but from several west of Harrisburg, besides those in Tennessee and Alabama. Presumably because of improvement in markets nearer home, these furnaces are no longer seeking business in this section, which, of course, throws more demand on the local companies. A second feature is in the heavy sales of Red-Short Irons to the Rail mills, which has in some measure removed another source of competition, so that the available supply of Pig Iron is much less than might be supposed, considering the only very moderate increase in local consumption. In other words, the scarcity is not so much the increase in local consumption as because of the withdrawal of competition by furnaces that, until within the last couple of years or so, were never heard of. There is still another reason for the remarkable strength in Pig Iron, and perhaps the strongest reason of all, viz., the general belief that business is certain to improve, and that the present basis of values is absolutely safe. The final settlement of the railway disputes is expected to be followed by orders for equipments of various kinds which all the roads are beginning to need, and with that, as in 1879-80, a revival of business in every direction. To what extent these theories will be realized remains to be seen; meantime confidence is increasing, if anything, and, with very limited supplies of Pig Iron available, it is not surprising that holders are firm. Sales have been on the basis of \$18 @ \$18.50, at tide for No. 1 Foundry; \$16 @ \$16.50 for No. 2, and \$15.50 @ \$16 for Gray Forge. The Glendon and Andover companies quote \$16 at furnace, although their agents claim to have their full capacity engaged for nearly three months to come.

Foreign Iron.—There is no inquiry at present, and nothing in sight likely to lead to an immediate renewal of demand. Prices are nominally \$19 @ \$20.50, c. i. f., for Bessemer according to brand; \$26 for 20% Spiegel, and \$67.50 for 80% Ferro-manganese.

Blooms.—The only the merest retail demand, asking prices being about as follows: Soft Basic Blooms, \$33.50 @ \$35; Billets, \$38 @ \$39, and Siemens-Martin, \$40 @ \$42; extra quality, \$43 @ \$45; Domestic Blooms, \$30.50 @ \$32, delivered, for Nail Plate, and \$35 @ \$36 for Plate and Sheet Blooms; Charcoal Blooms, \$50 @ \$52; Run-out Anthracite, \$43 @ \$44; Scrap Blooms, \$32 @ \$33; Northern Ore Blooms, \$32.

Muck Bars.—There is quite an active demand, but the supply is limited and prices are firm at \$27 @ \$27.50 at mill, with a moderate amount of business closed.

Bar Iron.—The demand for Bars is only fair, and, notwithstanding the many indications of improvement in outside business, it seems almost impossible to work up interest in the Bar trade. There is some business coming in all the time, but not enough to fill up the mills for more than a few days in advance; there is no weakness, however, and at 1.7¢ for Best Refined Bars only the very best class of orders are taken, 1.75¢ @ 1.8¢

being the general asking price. There is a movement on foot to secure one-tenth advance on store prices, which have for some time been pretty near to the rates quoted at mill. Skelp Iron is steady at 1.82½¢ @ 1.85¢, with a considerable amount of work on hand of that and other specialties.

Plate and Tank Iron.—The demand is not active, but many of the mills have a considerable amount of work on hand, while the current demand for small lots keeps them all fairly well employed. There is nothing of special interest in sight, and from appearances the present condition of things are likely to continue until the close of the year. Prices steady and unchanged, viz.: Ordinary Plate, 2¢; Tank, 2.1¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¢.

Structural Iron.—There is not much of interest to report, the demand being almost exclusively for small lots, and at that orders are not numerous. There is a good feeling, however, and manufacturers express entire confidence in the outlook for the near future, and as compared with last year at this time there is already very decided improvement. Prices are steady and unchanged, as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢; Tees, 2.4¢ @ 2.5¢, and Beams and Channels, 3¢. The contract for the bridge to be built across the St. Lawrence, referred to in our last, has been closed in favor of a Canadian company, the material to be furnished by a company in Scotland.

Sheet Iron.—The demand is still very good, and, with stocks reduced, as they are, to the lowest possible limits, prices are firmly maintained. The season has been very satisfactory, on the whole, and manufacturers are feeling quite encouraged at the general business outlook. Prices as last quoted, viz.:

Best Refined, Nos. 26, 27 and 28	4¢
Best Refined, Nos. 18 to 25	3½¢
Common, ¼¢ less than the above	
Best Bloom Sheets, Nos. 30 to 38	5¢
Best Bloom Sheets, Nos. 22 to 35	4½¢
Best Bloom Sheets, Nos. 16 to 21	4¢
Blue Annealed	3¢
Best Bloom, Galvanized, discount	57½¢
Common, discount	62½¢

Wrought-Iron Pipe.—There is no change in the Pipe market worth mentioning. The demand, while probably not so great as it has been the past month or two, still continues active. Prices show no change, and stocks are in better condition than they have been for some time. Discounts as follows: Lap-Welded Black Pipe, 60¢ off list price; Butt-Welded do., 42½¢; Butt-Welded Galvanized, 32½¢; Lap-Welded do., 42½¢; Boiler Tubes, 57½¢.

Nails.—The demand continues active, especially from the West. Stocks are very low, which makes it difficult to fill orders promptly. Prices continue firm at \$2.60, less the usual discount.

Steel Rails.—The steady demand for Rails has culminated in another advance; 10,000 tons have been sold for 1885 delivery at \$34, at tide; freight, \$1. The mills are full of work and quote \$33 as an inside figure, small lots a trifle over that. The feeling is feverish, but still higher prices are predicted, as there is an enormous demand in prospect.

Old Rails.—The supply of Old Rails appears to be about exhausted, bids of \$18, Philadelphia, or \$19.50 @ \$20 in the interior, failing to bring them out. No sales have been made, so far as known, so that prices are purely nominal as above quoted.

Scrap Iron.—The supply is light and prices firm, and outside figures readily obtainable for interior deliveries. The asking rates are about as follows: No. 1 Wrought Scrap, \$18 @ \$19; No. 2 do., \$12 @ \$13; Horse Shoes, \$22 @ \$23; Turnings, \$13 @ \$14; Old Car Wheels, \$14 @ \$14.50; Old Steel Rails, \$16; Fish Plates, \$22 @ \$23; Cast Scrap, \$13.50 @ \$14; do. Turnings, \$10 @ \$10.50.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, Pa., November 10, 1888.

The general business situation hereabouts has not improved during the past week, to be accounted for chiefly by the bad weather we have had and the almost impassable condition of the country roads in some localities. In regard to the labor question there is nothing important to note, with the exception that there are indications that the coal miners' strike in the Monongahela Valley is drawing near to an end. Already reports from the upper end of the river state that a number of the striking miners have resumed work at the reduction, and it is expected that others will follow within the next few days. The nailers' strike still continues; the strikers are confident that the manufacturers are about ready to succumb, but the latter say they have no such intention. The Western Nail Association will meet at Cincinnati to-morrow. As the recent advance in rail freight was general, we hear but little complaint. Chess, Cook & Co., who are building new Steel works at Braddock, about 12 miles up the Monongahela Valley, expect to have some departments in operation within a few weeks. Next year they expect to move their Nail and Tack factories from the Southside up to where their new Steel works are located, so as to have their works all together. One of the Lucy Furnaces is not working satisfactorily, and it is feared will have to be blown out for repairs. We hear of several idle furnaces that are likely to be started up soon. One of our furnace companies are reported as having 20,000 tons of Pig banked up which they intend to hold

for a better market; the same company are disposing of their present production at market price.

Iron Ore.—Advices from Cleveland continue to report a scarcity of Bessemer Ores. It is claimed that they have about all passed out of first hands. But for the scarcity of these it is probable that a number of furnaces now idle would be started up on Bessemer Iron. Of other descriptions of Ore there is a fair supply.

Pig Iron.—There has been no important change in the general position of the market since our last report; demand keeps up well, and the brokers say there is not much trouble in selling at ruling prices, but that it is impossible to realize any advance on Foundry or Forge Irons, the supply of which continues fully up to present requirements, although it is doubtful whether producers can be found willing to contract for future deliveries at present prices. There appears to be no abatement in the demand for Bessemer, and it sells readily at the recent advance. So far as we can learn, there have been no sales above \$17.50, cash, but it is doubtful whether any more could be bought at that price. It looks as if the supply would be short of the demand for some time to come, in consequence of the scarcity of Bessemer Ores, and still higher prices in the near future are not improbable. Some of the brokers predict that Bessemer Iron will advance 50¢ @ \$1 per ton more before the present year. We quote as follows:

Neutral Gray Forge	\$14.50 @ \$15.00, 4 mos.
All-Ore Mill	15.50 @ 16.00, 4 "
White and Mottled	13.00 @ 13.50, 4 "
No. 1 Foundry	16.50 @ 17.00, 4 "
No. 2 Foundry	15.00 @ 15.50, 4 "
All-Ore Foundry	17.50 @ 18.00, 4 "
Charcoal Foundry	18.00 @ 22.00, 4 "
Cold-Blast Charcoal	22.00 @ 26.00, 4 "
Bessemer Iron	17.50 @ cash.

Muck Bars.—There is a fair degree of activity, and the market may be quoted steady at \$26 @ \$26.50, cash; sale of 600 tons at \$26.25, cash.

Manufactured Iron.—While possibly there is not as much new business as there was some time ago, the mills are still reasonably well employed, some of them working up to their full capacity. The fact of the matter is, trade is holding out better than was expected some time ago, but prices remain unchanged. Some of the mills using Old Rails have been enabled to undersell those using Pig Iron, but, now that Rails have advanced and bid fair to go still higher, the former have but little advantage over the latter, and a good many buyers refuse to buy the product of Old Rails. Prices are still quoted on a basis of 1.60¢ @ 1.70¢ for Bars, 60 days, 2¢ off for cash. Skelp Iron, the demand for which continues quite active, is firm at 1.75¢ @ 1.80¢.

Nails.—The strike is still in progress, and while, of course, it is nearer its end, it is difficult to foretell at present when it will be brought to a termination. Pittsburgh jobbers are still getting their supplies from the East, and are selling, regardless of quantity, at from \$3.25 to \$3.50, 60 days, 2¢ off for cash. Some are 25¢ @ 50¢ per keg above prices quoted. Advices from Wheeling say that the number of machines in operation and being run non-union is steadily increasing, and manufacturers there are confident of being able to break the strike. The regular monthly meeting of the association takes place to-morrow at Cincinnati.

Wrought-Iron Pipe.—The mills continue very busy, but few of them being able to keep up with their orders, and it looks now as if this would continue until the close of the year. This has been the biggest year the Pipe mills ever had, caused in large part by the active demand from natural-gas companies. Prices firm, but unchanged. Discounts on Black Butt-Welded Pipe, in carlots and upward, 45¢; less than a carload, 42½¢; Galvanized do., in carlots, 35¢; less, 32½¢; Black Butt-Welded Pipe, in carload lots and upward, 62½¢; less, 60¢; discount on Boiler Tubes, 57½¢; 2-inch Oil-Well Tubing, 13¢ per foot net; 5½-inch Casing, 40¢; 8-inch Drive Pipe, \$1.30 per foot, net.

Merchant Steel.—There is a continued good degree of activity, but no improvement in prices, which manufacturers complain of as being unsatisfactory. Best brands Refined Cast Steel, 8½¢; do. Crucible Machinery, 4½¢ @ 4¾¢; Bessemer and Open-Hearth do., 2½¢ @ 3¢. No sales of Steel Nail Slabs reported recently, in the absence of which we omit quotations.

Old Rails.—Old Iron Rails continue in scant supply, and, with considerable inquiry, the prices are firm; while there have been no sales reported above \$19.50, cash, it is doubtful whether they could now be had under 25¢ @ 50¢ per ton additional. Some of the closest buyers have paid \$19.50. Old Steel Rails also scarce and tending upward. We now quote at \$18 @ \$19, according to lengths.

Steel Rails.—The market for new Steel Rails continues strong, and while, so far as we know, there have been no sales above \$31, cash, at mill, there is every reason to believe that no additional sales would now be made under \$32, cash, at mill, and but very few of the mills are able to accept additional orders for near delivery.

Railway Track Supplies.—Spikes have been advanced to 2¢, 30 days, delivered; Splice Bars remain unchanged at 1.60¢ @ 1.70¢, and Track Bolts at 2.75¢ @ 2.85¢.

Old Material.—No. 1 Wrought Scrap remains unchanged at \$16 @ \$17 per net ton; Wrought Turnings, \$13 @ \$14; Old Car Axles, \$22 @ \$23; Cast Scrap, \$13

gross ton; Cast Borings, \$10.50 @ \$11; Old Car Wheels, \$14.50 @ \$15. Cast-Steel Scrap scarce and in demand. Steel Bloom Ends quoted at \$18 @ \$18.25, and Steel Rail Ends at \$18.50 @ \$19.

Window Glass.—Manufacturers continue to quote discounts at 75¢ on Single and 75 and 10¢ on Double Strength.

Coke.—About 60% of the syndicate ovens are now in operation. Blast-Furnace Coke remains unchanged at \$1.20 per ton, on cars at ovens.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., CHICAGO, November 9, 1888.

Hardware.—The rain-storm that prevailed most part of the past week kept many city and country people indoors and made country roads almost impassable in some sections, which had a depressing effect upon all lines of retail trade. The retail demand upon the jobber was therefore lighter than expected for the opening week of the month, and yet much better than in the preceding one. Many orders were received through the mail direct from retail merchants for Shovels of all kinds, Handles, Strap Hinges, Wood Saws, Stove-pipe, Coal Hods, Builders' Hardware, Tin Plate, Cutlery, &c., there being a steady increase in demand for the latter. On Stamped Tinware jobbers have advanced their price 10¢ to correspond with the change made by the Central Stamping Co. On other lines a few minor changes have been made, though prices as a rule are firm and steady.

Barb Wire.—The market from a business point of view is almost entirely devoid of interest. The demand made upon jobbers is so insignificant that it scarcely justifies the claim of a market. On such lots as jobbers are disposing of they continue to quote \$3.50 for Painted Wire and \$4.50 for Galvanized. In manufacturing circles the busy trade of a month ago has dwindled down to the point where it is difficult to obtain sufficient orders for immediate delivery to keep their machines employed. Some of the mills who have confidence in the prospect of an advanced price are running their machines with the intention of piling up the Wire in their factories for spring trade. Others who have less confidence in the present price of Plain Wire are undecided as to the chances of obtaining better prices for Barb Wire, are going very slow, and have laid off part of their force and only running a portion of their capacity on stock goods. A meeting of the manufacturers who have signed the combination agreement will be held in this city on the 17th inst., for the purpose of completing their organization and electing officers.

Nails.—During the past week there was no material change in the situation. Whatever change there is would be in favor of better stocks and a slight decrease in demand. Iron Nails have ruled steady and firm during the week at \$3.25, and Steel Nails at \$3.35. While these prices are concurred in by all jobbers in this market, there are those among them who have very little faith in the continuation of present prices, and are purchasing stocks only to meet the immediate demand. There is an inclination with one house at least to sell Nails subject to arrival from mills rather than load themselves with the commodity that would meet with immediate reduction in price should there unexpectedly be a compromise between manufacturers and nailers at their next meeting. Various rumors are current upon this topic, and, though manufacturers are reported to be firm in their determination to withstand the demands of the Nailers, the latter claim that the chance for their obtaining concessions from manufacturers is decidedly better than it has been at any time since the strike began. Consumers, retailers and jobbers are prone to foresee the final outcome of this conflict, and every source of information is being searched and watched with the utmost care. The prices quoted above are about the same as those asked at all the jobbing points in the West, there being, however, one or two places where an advance of from 10¢ to 15¢ per keg on these prices is asked. The starting of the Belleville Nail Works is said by jobbers to be an important factor in the market, and will have no effect upon prices nor weaken the manufacturers in their position.

American Pig Iron.—The improvement which began two months ago is now regarded as a permanent feature by both sellers and buyers, and the nonchalance with which furnacemen refuse to fill orders has a sort of overawing effect upon the consumer. Furnacemen frankly state that prices have been advanced and that their Iron is pretty well absorbed, but that they are willing to take small orders at 25¢ @ 50¢ advance over former prices, saying that they should have even more than the figure demanded, but their sympathy for the consumer prevents them from obtaining the highest figure that the condition of the market would warrant them in asking. On the part of many sales agents there is a desire to make the purchaser feel that he is conferring a great favor to sell them Iron, which apparently has the effect of making the purchaser more anxious to obtain it than he would be under other circumstances. The market undoubtedly continues in favor of the seller, and has not in any way, so far as can be seen, retrograded a single point since the upward movement began. Another favorable point in the market is the unexpected demand which is constantly coming

in from manufacturers who are duplicating the orders which they previously placed, supposing that it would be enough to carry them over the year. Much of this iron is taken at a slight advance on the price paid for the first lot. Manufacturers of various lines of goods throughout the West are reporting an increase in their trade, and buy the iron, not to cover, but because their business demands it. We hear of those who had bought iron for shipment in January and February that were forced to have it in October and November, and subsequently placed orders to cover the time thus unprepared for. Quotations on Charcoal iron remain at about the same figure, Choice brands of Nos. 1, 2 and 3 commanding \$19.50, four months, in carload lots, and Nos. 4, 5 and 6 at \$20, with a grade of iron not regarded as equivalent selling at 50¢ a ton less. Lake Superior Coke Irons are held steadily at \$18 @ \$19 in carload lots, though it is said that there are some grades of Coke Iron that would be sold at figures that were not acceptable a week ago. Cinder Mixed continues steady at \$17 @ \$17.50, and Ohio Standard Blackband firm and scarce at \$19 @ \$19.50. Soft Irons are said to be more scarce than any other, and, if anything, command the best figures. Briar Hill No. 1 is quoted at \$20, and No. 2 at \$18.50; Hubbard at \$19, cash, on cars, Chicago; Low Moor is quoted \$19.50, and Southern No. 1 Foundry, \$18; No. 2, \$17; No. 2½, \$16; No. 1 Mill is unchanged at \$15, and No. 2, \$14.50; Open Bright is said to be in good request at \$17.50. The advance in Southern Irons has brought into close competition Irons from the Mahoning Valley, which are selling at about the same figures, and it is said by consumers that they are preferred for many purposes. This will in some measure retard a further advance in Southern Irons unless the Ohio Irons are more closely absorbed than at present.

Scotch Iron.—We renew our quotation of \$24. Business not very active, and stocks that were on hand are sold up.

Merchant Steel.—Transactions seem to be by spurts. The past week has had a fair trade, in small lots, but nothing of any importance has been brought out. We renew quotations on High-Grade Tool Steels, 9½¢ @ 13¢; Specials, 15¢ @ 20¢; Ordinary, from 8¢ to 9¢, and Low Grade, 7¢; Open-Hearth and Bessemer, 2½¢ @ 3¢; Crucible, 4½¢ @ 5¢; Plow Steels, 5¢ @ 5½¢.

Steel Rails.—There has been considerable activity during the past week, and a number of sales that were made the week previous have leaked out. While we have not been able to obtain the exact quantity of tons that have been sold, we nevertheless learn from reliable sources that mills are in a position where they can feel independent and are asking an advance of about \$2 ½ ton on last week's price, this being governed by time of delivery and number of tons under negotiation. A gentleman connected with one of the mills in this city states that they are not open to orders at less than \$37, and the ruling quotation seems to be from this down to \$35.

Structural Iron.—There has been very little doing in Architectural Shapes during the past week. Jobbers report a fair demand in small lots for Beams from store, and great urgency for delivery of those which are under contract. It is not likely that there will be any new building operations started this fall, though there is in prospect preparation for several large structures which will begin early in the spring, and the Ironwork may be let before winter sets in. Prices remain about as last quoted.

Bar Iron.—Manufacturers and jobbers of Refined grades claim that they foresee an opportunity for better prices. Many of the small mills that have been running on a low grade are now pretty well filled up, and the larger concerns are apparently desirous of securing better figures than they have obtained heretofore. Should prices on Old Rails and Common Iron be advanced 1½¢ it will be possible for manufacturers of Best Refined New Puddled Iron to obtain \$1.80 rates from mill. For some time past they have only been getting this figure for small lots from store. Mill quotations range from \$1.65 to \$1.70. Ordinary Bars are quoted at \$1.60 @ \$1.70 from store, and \$1.50 from mill. Later developments on the sale for 14 months' delivery noted in our last report shows that the contracting parties were more desirous of introducing the Ores produced on their own lands, which gives them an opportunity of developing new mines, than they were in making a profit on the Bar Iron they sold. This same mill has obtained several contracts of a similar nature, and it is presumed have secured all the work that they will need for next year, which relieves the market of a depressing element.

Old Rails.—There has been a fairly good demand in the past week, which could not be supplied at prices quoted. Railroads and holders of stock continue to demand from \$1 to \$1.50 above the price paid, which is \$18 @ \$18.25, Chicago delivery, and \$17 @ \$17.25, Milwaukee. Old Steel Rails continue firm at \$13.25 for Short Sections and \$14.50 for Long Sections.

Black Sheets.—There appears to be no change in price, while mills are holding their figures more firmly than was expected for delivery during November and December. The demand in small lots is very active, but heavy buyers are not placing orders with any liberality. The falling of the mill at

Niles is looked upon as being favorable to other manufacturers, as there are quite a number of contracts that will likely be canceled, and removes temporarily from the market a quality of iron that did not command the highest price. We renew the following quotations as jobbers' price from store: No. 24 at \$3.10; Nos. 25 and 26, \$3.20, and No. 27 at \$3.30.

Galvanized Iron.—Mill agents report that they are very busy and have a good demand from jobbers and retailers for small lots. Quotations are unchanged, but something more than the concessions that prevailed during the last two months are said to have been made in the last few days. This would indicate that makers are weakening on the prospect of the demand ceasing, and that they must provide for work during the winter months. For immediate delivery all mills claim to be busy. Jobbers continue to quote Juniata 60¢ off and Charcoal 60 and 10¢ off, as heretofore.

Old Wheels.—The demand is better than noted some time back. There are numerous buyers in the market for Wheels at from \$13.50 to \$13.75, but the lowest quotation that is made by those who have any on hand is \$14, while some are asking \$14.50. We hear of one sale at \$15.

Scrap Iron.—Continues fairly active and the demand increasing for No. 1 Forge at \$16 @ \$16.50. No. 1 Mill is quoted at \$13.50 @ \$14; No. 2, \$8.50 @ \$9. Dealers' purchasing prices are unchanged, as follows: No. 1 Wrought, \$13; Machinery, \$12; Stove Plate, \$7.50; Steel Tires and Wagon Springs, \$12.50; Old Plows and Plow Steel, \$9; Wrought-Iron Turnings, \$8.50; Cast-Iron Borings, \$7.50; Malleable Scrap, \$6.

Pig Lead.—Has been featureless since our last report, and values entirely nominal. Manufacturers are purchasing very sparingly, anticipating lower prices. Sales for the week foot up about 250 tons at 4¢. As the demand is very light, this price is by no means firm, but indications are that it will remain steady at about this figure if not forced down by speculative motives.

Mr. Charles E. Billen, 186 Dearborn street, Chicago, who represents the Pencoyd Iron Works, Michigan Bolt and Nut Works, Eureka Iron and Steel Works and the Empire Chain Works, announces to the trade that he is prepared to furnish prices on Iron made by the Pullman Iron and Steel Co., whose works are located at Pullman, Ill. Also that he will hereafter represent the Cincinnati Corrugating Co. for Corrugated Iron and Standing-Seam Roofing. He reports present business good, and prospects for future trade very encouraging.

Messrs. Mack & Durkee, Cincinnati and Chicago Pig Iron sales agents, have secured the exclusive agency for the Bellefont Coke Iron made by the Ironton Furnace Co., of Ohio, and will hereafter handle their entire product.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, November 9, 1885.

A review of the general business outlook for the past week has shown that trade has moved quietly along, with no particular fluctuation to note. Manufacturers are as a general thing working up to their capacity, with a full line of orders ahead to keep them from any uneasy feeling as to the future. It is true that many of the factories, especially on the line of cloths, are making only the coarser fabrics, and many of those who are engaged in other special lines are yet only in condition to meet the competition of a rougher class of goods, yet these very concerns are adding to their plants as fast as they can, and may be said to be improving every day in the character of their output. The heavy rains of the past week have given another set-back to the marketing of crops, and reports from some sections of the country are very discouraging. Corn in the overflown sections will be nearly destroyed, and cotton will fare very badly. The merchants and banks are complaining of slow collections, while some accounts will no doubt have to stand over until another year. The traveling public are just now enjoying a boom in fares, and rates are being cut to points South at mere nominal figures. The consequence is that travel is heavy to points in South Georgia and Florida, and excursions are the order of the day.

Pig Iron.—Quietness continues all along the line, with hardly a ripple to create any excitement. From letters of inquiry it would seem as though there was room for a dozen more furnaces in the Southern district. None of the makers have any trouble in placing all the iron they desire at ruling rates, while makers of favorite brands are not able to supply the demand, and prices on such are stiff, the sale of 1000 tons of No. 2 Foundry netting the furnace, f.o.b., \$12.90. This gives a fair idea at what round lots are going, while single carlots of No. 1 are being readily sold at \$14.25 @ \$14.75, according to brand, at the furnace. A matter is strongly talked of by a few heavy capitalists from the North that may have an effect to stiffen up prices to some extent, and that is the purchasing of 25,000 to 50,000 tons and simply laying it by.

Lumber.—This article is getting to be of considerable interest in the South, and timber lands are attracting attention more and more. Small syndicates are being

formed all over the South for the purchase of these lands, now that they are cheap, and the timber on many purchases already made has realized many times more than was paid for the lands, with the real estate left, which as a general thing is good farming land. In this particular locality the recent rains have so swelled the river that rafting of logs is now the order of the day, and purchases of 5,000,000 to 10,000,000 feet are not uncommon, and the coming winter and spring promises the largest Lumber business of any year that has passed.

Birmingham.

BIRMINGHAM, Ala., November 9, 1885.

Averaging this whole section of country, and one time with another, business is possibly a little short of what it ought to be, especially if the promises of a few weeks ago are considered. Here in Birmingham, however, it is a little hard to judge, the local conditions being somewhat exceptional in degree, if not in kind. Evidences are to be seen almost every day that the wholesale trade of this place is growing rapidly.

Pig Iron.—The iron trade of the last week furnishes almost nothing for the newsgatherer. In market conditions there is absolutely nothing new beyond the result to date of what has been going on ever since midsummer. This appears in the reports of stock on hand on the 1st, the aggregate of these being considerably below last month's footings. The bulk of the stocks is Mottled Iron, and of this a considerable proportion of what the reports embrace is sold. High-grade Irons are hardly to be had in large or in small quantity. Outside of old contracts, shipments are mainly to satisfy a kind of hand-to-mouth orders that are all buyers can place in this district now at present prices. One concern, the Eureka, has the hard luck to be forced out of blast for a while, just at this time of better demand and supposed eve of better prices. One of its furnaces is undergoing repairs, having been blown out a few days ago, while a remodeling of the other was already under way. In the latter case an all-brick stack is to give way for an iron shell.

Roller Iron.—There is proof right on the streets here that the rolling mills are not able to keep up their orders. An important new street railroad line is waiting for its rails.

Nails.—For the first time in a month or so no advance is to be quoted on the Briarfield and Helena Nail card. Indeed, last week's rate of \$3.25 has hardly been maintained. Nails can be bought from the dealers here at that price. It seems they have been able to lay them down from Eastern mills at a little less than the nominal card, f.o.b., at the home mills. The latter are supplying their trade here a little more promptly, too, though they are still behind their orders from a distance. It is their policy apparently to prefer home orders, so far as possible. Opinions differ here as to what turn prices are going to take.

Miscellaneous.—There happens to be a little less foundry and machine-shop work doing here now than there has been, but there is no saying how just such chance business has kept everybody busy may pile in again.

Coal and Coke.—The coal business does not improve, mainly, to all appearances, because of a chronic state of overproduction. In view of the better outlook for iron, Coke seems to have better chances than Coal, and the logical effect of this appears in promises of more Coke ovens. The iron prospects are doing more than this, though they are tempting Coal concerns into iron-making more than ever. The Watts Coal and Iron people are now considering a furnace project, while the Pratt management are keeping the Linn Iron Works steadily at work on their two furnaces, whether they are to be put up for the company or not. Chance orders for Steam Coal are light everywhere. For the last week or so there has been an unusually heavy demand for Grate Coal. One of the leading Coals of this character, the Pratt Co.'s Helena is out of the market just now, a strike and shut-down at the mines being the cause.

Building Material.—Shipments of Lumber from the mills below here to distant territory continue to be very heavy, but the demand has not yet affected prices. Locally there is not such a demand as there was two months ago by a good deal. In other building material, however, Structural Iron notably, there is a brisk business doing here now, and nearly everybody's stock is short.

Cincinnati.

NOVEMBER 9, 1885.

Pig Iron.—No material changes in the market to note, supply, demand and prices remaining about as noted last week. There seems to be no disposition on the part of makers or holders to accept orders for deliveries beyond the present year. Quotations for the past week:

CHARCOAL FOUNDRY.		
Hanging Rock, Best, No. 1, 4 mos.	\$20.00 @	\$20.50
Hanging Rock, Good, No. 1, 4 mos.	19.00 @	19.50
Hanging Rock, No. 2, 4 mos.	18.00 @	18.50
Southern No. 1, 4 mos.	17.50 @	18.00
Southern No. 2, cash.	16.50 @	17.00
COKE FOUNDRY.		
Ohio and West Pennsylvania, No. 1, 4 mos.	16.00 @	16.50
Ohio and West Pennsylvania, No. 2, 4 mos.	15.50 @	16.00
Southern No. 1, 4 mos.	14.50 @	15.00
Southern No. 2, 4 mos.	13.50 @	14.00

SILVER-GRAY SOFTENERS.		
Hanging Rock (Jackson County), No. 1, 4 mos.	16.50 @	17.00
Hanging Rock (Jackson County), No. 2, 4 mos.	15.50 @	16.00
Hanging Rock (Jackson County), No. 3, 4 mos.	15.00 @	15.50
Other makes, various grades, cash	18.50 @	19.00
Charcoal, 4 mos.	17.00 @	17.50

CAR WHEEL.		
Hanging Rock Charcoal Cold-Blast, 4 mos.	23.00 @	23.50
Hanging Rock Charcoal Warm-Blast, 4 mos.	19.00 @	20.00
Southern Charcoal, Warm-Blast, 4 mos.	18.00 @	19.00
Southern Standard, Warm-Blast, 4 mos.	22.50 @	23.50
Georgia Standard, Cold-Blast, 4 mos.	25.00 @	25.50

No considerable sales of Forge reported. Quotations, \$12.50 @ \$14, cash. Scrap market dull; but little movement; no prices reported. Discount for cash, 50¢ per ton from time prices. Above quotations on Pig Iron are f.o.b. here, or less the freight to Cincinnati if deliveries are at furnaces.

St. Louis.

W. H. SHIELDS, 305 Olive street, St. Louis, reports as follows, under date of November 9: The market here is by no means satisfactory. There is less inquiry and considerable cutting, especially in Irons a little off grade.

CHARCOAL FOUNDRY.		
Missouri, No. 1, 4 mos.	\$14.50 @	\$15.50
Southern, No. 1, 4 mos.	17.00 @	18.00
COAL AND COKE FOUNDRY.		
Missouri, No. 1, 4 mos.	15.00 @	16.00
Southern, No. 1, 4 mos.	15.00 @	16.00
American Scotch, No. 1, 4 mos.	16.00 @	17.00

MILL IRON.		
Missouri, No. 1, 4 mos.	14.00 @	14.50
Southern, No. 1, 4 mos.	14.00 @	14.50

CAR-WHEEL AND MALLEABLE.		
Missouri, No. 1, 4 mos.	20.00 @	21.00
Southern, No. 1, 4 mos.	20.00 @	21.00
Lake Superior, No. 1, 4 mos.	20.00 @	21.00

SCRAP, ETC.		
Old Wheels, No. 1, 4 mos.	14.25 @	14.50
Old Rails, No. 1, 4 mos.	17.50 @	18.50
Wrought Scrap, No. 1, 4 mos.	60 @	70
Cast Scrap, No. 1, 4 mos.	50 @	60
Connellsville Coke (East St. Louis), No. 1, 4 mos.	5.30 @	5.50

Louisville.

W. B. BELKNAP & Co., Louisville, under date of November 9, 1885, report as follows: The month of November, usually a dull one in Iron and Hardware circles hereabouts, opens up with an encouraging volume of trade. The improvement in prices, however, which was promised us during the more active months of August and September has not manifested itself except in a few articles that were before that time abnormally low, probably below cost. Carriage Bolts, Hinges and Spikes have all scored an advance, and so far are firmly held by the manufacturers. Several of the more observant minds and thoughtful heads in the trade were slow to accept the newspaper construction of the fall trade as indicating a permanent revival, and said at the time that we should see little, if any, important change in prices before 1886. That preparations for spring trade are made with this view is borne out by the fact that, while manufacturers are free sellers just now, few are willing to contract at the present prices for delivery next year, and about the latter part of December or the first of January we expect to see a good many outstanding quotations withdrawn to make way for new and slightly advanced ones. The railroads seem to be arriving at a better understanding as to rates, and if the new tariffs are adhered to their improved earnings will have its effect on the rest of business. It is to be regretted that personal differences between officers and agents of rival roads are often permitted to find violent expression by cutting both passenger and freight rates, regardless of the interests of stockholders. This is a liberty particularly indulged in when a road is in the hands of a receiver, when its management does not even pass under the supervision of a board of directors, but is amenable only to a very indifferent court.

Bar Iron.—There is no change to speak of in Bars. Some specialties are being offered extremely low, but Bars proper, if anything, are a trifle stronger than they were last summer. The mills all declare they are paying more money for Pig, and insist that their expenses of making Bars are increasing all the while. At the same time the demand is still insufficient to make anything like a strong market. **Hoops and Bands.**—The manufacturers of these specialties are firm in their prices. **Sheets.**—Light Sheet has settled down to a price some \$3 @ \$4 above the spring figure which prevailed before the closing of the mills. It was not to be expected that the high price which was made during the great scarcity could long be maintained. Heavy gauges are not very plentiful, and there is some difficulty in getting assorted orders filled with promptness. The failure at Niles of a mill running exclusively on Sheet, yet run as economically as possible, we take it, shows how little profit there has been in this business at last summer's prices. **Steel.**—The season is opening fairly well on Agricultural Steel. Shapes are beginning to be called for by the smaller makers, and the mills profess to be running full. The prices on Tool Steel are very irregular if one takes all the brands into consideration, but the leading makes are steady, and those which have become well known for their uniform excellence are selling in good quantities. **Nails.**—There are rumors every few days of a cessation of the Nail strike. Predictions have been freely indulged in all the while that it would soon be over. The starting up of Belleville, and the addition of almost 40 machines, as we learn, to the manufacturers' scale, taken in connection with the fact that the season is far advanced, has done a good deal to relieve the market. Prices here range anywhere from \$2.75 to \$3, which is less than we hear of elsewhere, but the proximity of the Nail mills and the readiness with which manufacturers can realize on their shipments make this a favorable point for shipments and distribution. Some 8000 kegs, which have been at times sunk on the falls, were lately auctioned off here, scoured and sold under the present favorable conditions. This is no great quantity for this market, but it is one of a good many causes which have served to restrain the price of Nails from climbing too high.

A good deal of building is going on in our own and neighboring cities. Hogs and country produce generally are low, so that

the farmers are complaining for lack of money, but when it comes to buying their supplies they find that a little money goes a great way. The reduction in the price of Agricultural Implements, Barbed Wire, Plow Singletrees, &c., has been amazing when one compares the present figures with those of a few years ago. **Wire.**—Is slow, as it is everywhere. Every now and then we are promised that "next week" the advance is going to take place sure enough, but so far there has been no realization, nor do we see how there can be until toward spring. **Ammunition.**—Is a little firmer, as there are hints of the manufacturers arranging with the large jobbers to maintain the agreed prices. **Shot.**—Drop has fully justified its name, and since the break in the association has declined some 15¢ or more a bag. The rivalry among the makers is at present as hot as is consistent with comfort.

GEORGE H. HULL & Co., of Louisville, report to us as follows, under date of November 9, 1885: **Pig Iron.**—The market for Pig Iron has not been so active as the week before, but is fully as firm. Sales have been curtailed on account of most of the Irons which were offered at a bargain having been picked up, and present sales are made at full market quotations. We quote for cash in round lots as follows:

PIG IRON.		
Southern Coke, No. 1 Foundry, No. 2	\$16.00 @	\$17.00
" " " " " " " "	15.00 @	16.00
" " " " " " " "	14.50 @	15.50
Hanging Rock Coke, No. 1 Foundry, dry	16.00 @	16.50
Hanging Rock Charcoal, No. 1 Foundry, dry	19.00 @	20.00
Southern Charcoal, No. 1 Foundry, dry	17.50 @	18.50
Silver Gray, different grades	14.50 @	15.50
Southern Coke, No. 1 Mill, Neutral	14.00 @	14.50
" " " " " " " "	13.00 @	13.50
" " " " " " " "	13.50 @	14.00
Southern Charcoal, No. 1 Mill, Neutral	13.50 @	14.00
White and Mottled, different grades	11.50 @	12.50
Southern Car-Wheel, standard brands	17.00 @	18.00
Southern Car-Wheel, other brands	22.00 @	23.00
Hanging Rock, Cold-blast	17.00 @	18.00
" " " " " " " "	25.00 @	26.00
Warm-blast	25.00 @	26.00

Old Material.—The market for Old Material is quiet. Wheels are dull at the advance, and other grades are still dull at the old prices:

Rails, 7½ ton	\$17.00 @	\$18.00
Wheels, 7½ ton	13.00 @	14.00
No. 1 Wrought, 7½ ton	13.00 @	14.00
Country Wrought, 7½ ton	50 @	60
No. 1 Cast, 7½ ton	50 @	60
Boilers, cut, 7½ ton	60 @	65
Boilers, uncut, 7½ ton	40 @	45
Axles, 7½ ton	30 @	35
Flues, Tanks and Sheets, 7½ ton	25 @	30
Burned Scrap, 7½ ton	30 @	35

Detroit.

CHARLES HIMROD & Co., dealers in Pig Iron, Detroit, Mich., report, under date of November 9, 1885, as follows: Notwithstanding the fact of large contracts being in prospect, and also several large options being out, the business of the past week has been decidedly dull, though not altogether unsatisfactory. Our market recently has been a rather peculiar one on account of its fluctuations. As a rule iron, once that it commences to rise, goes steadily on, and the same may be said of its decrease in price once that it starts that way; but of late the market has upset all the calculations based on previous happenings. An order is accepted one day by the Southern people and refused the next perhaps at 50¢ better. Charcoal has remained firm, with but few slight movements, but we look for the break on this grade of iron to regulate the others. For round lots on four months' time we present the following:

Lake Superior Charcoal, Nos. 1, 2 and 3	\$19.75 @	\$20.25
Lake Superior Charcoal, Nos. 4, 5 and 6	20.00 @	21.00
Lake Superior Coke, All Ores	19.50 @	20.00
Lake Superior Coke, Cinder Mixed	17.50 @	18.00
Standard Ohio Blackband	19.50 @	20.00
Southern No. 2	17.00 @	17.50
Southern Silvery, Open	16.50 @	17.00
Southern Silvery, Close	16.00 @	16.50
Jackson Co. (Ohio) Silvery	18.00 @	18.50
No. 1 Southern Mill	14.25 @	14.75
Old American Rails, Iron	19.00 @	20.00
Old Wheels	15.75 @	16.50

Baltimore.

R. C. HOFFMAN & Co., Pig and Railroad Iron Merchants, 21 South Frederick street, write as follows, under date of November 9, 1885: There is no change in the Pig-Iron market, with a fair demand for immediate use. Prices remain steady, and we quote as follows:

Baltimore Charcoal Wheel Iron (all)	\$20.00 @	\$21.00
Baltimore Ore	25.00 @	26.00
Virginia Cold-Blast Wheel Iron	18.00 @	19.00
Anticline No. 1	18.00 @	19.00
" " " " " " " "	16.00 @	17.00
" " " " " " " "	14.00 @	15.00
" " " " " " " "	13.00 @	14.00

Coal Market.

The market for Anthracite is a little off this week as to demand, but prices are unchanged. Jobbers are impatiently waiting for cold weather as the signal for renewed activity. We quote Pittston at Newburg as before, viz: Lump, 7½ ton, \$3.30; Grate and Egg, \$3.25 @ \$3.35; Stove, \$3.00; Chestnut, \$3.60; Pea, \$2.30; 50¢ per ton additional for delivery discharged at New York, or 35¢ per ton for delivery alongside. Lehigh, for steam purposes: Broken, \$3.50; Egg, \$3.75; Pea, \$2. Bituminous continues in better demand at about \$3.25, but a large proportion of the deliveries is on account of old orders, which are less remunerative. Western business is reported good. It has been proposed to form a combination of the several interests engaged in the Bituminous trade, which shall regulate shipments and prices, but the prospect of harmonizing all interests is not very promising.

The total amount of Anthracite Coal sent to market for the week ending October 31 was 893,137 tons, compared with 517,042 tons in the corresponding week last year. The total amount of Anthracite mined thus far in the year is 25,507,026 tons, compared with 25,248,293 tons for the same period last year, an increase of 318,733 tons.

Berwind, White & Co. have just completed the purchase of valuable collieries in the Clearfield district, lately owned by Harned, Jacobs & Co., in consideration of \$290,000, cash. About 2000 men are employed.

Trade Report.

General Hardware.

The condition of the market shows no important change in its general features. A few changes in price are occurring, which are noted below. The volume of trade, while indicating some falling off, is fair, and a good many goods in small lots are being sold.

BARB WIRE.

The market has been very dull and quiet, the demand being light, as is usual at this season of the year. We quote nominally 4.35 to 4.40 cents for Four-Point Galvanized Barb Wire, with small lots at 4.50 cents.

NAILS.

So far as this market is concerned, the situation is unchanged. The demand is within the limits of the absolutely necessary, and is very moderate. Still, with the requirements for the West, the Eastern mills are unable to produce fast enough to improve the condition of stocks or fill the gaps in the assortment. In other words, the demand still exceeds the current supply. The market remains strong, manufacturing agents quoting \$2.50 and \$2.60 from store respectively for large and small lots. It should be stated, however, that they confine their sales chiefly to their regular customers. The situation in the West continues to improve, the manufacturers gaining steadily. It should be noted, too, that the demand from the Northwest is showing signs of abatement, the season in that section coming to a close. Associated Press dispatches allude to efforts at a compromise to be made by the Nailers at a day's meeting of the manufacturers. It is pointed out, as a circumstance that may defeat any such attempt, that the manufacturers have pledged themselves to maintain the feeders who have become nailers in their new positions. This would render it impossible to employ a corresponding number of nailers, a circumstance likely to lead to hitches in any negotiations. We are informed also that the Wheeling makers feel strongly on the subject of fighting it out under any circumstances, and evince a determination to insist upon their demands without a compromise of any kind. It is insisted that a falling off in the demand a good deal of the present pressure will be removed.

WILLIAM DARLING.

The death of William Darling of the well-known house of William Darling & Co., Montreal, occurred on the 1st inst. He was about 65 years of age, a native of Edinburgh, and came to Montreal about 1840, and at once began to build up the extensive Hardware trade which now stands an honor to his enterprise and business sagacity. Appreciative tributes are paid to his character and worth by the newspapers of his city, and as one of the best known of Canadian merchants he is referred to as having for many years stood in the front rank of the business men of Montreal, and having by industry, keen intelligence and strict integrity established a large and lucrative business. His high character and the esteem in which he is held are evidenced by the gratifying tributes paid to his memory. Having been for about 40 years in the wholesale Hardware business, his name is well known to the trade of the United States, who will learn with regret of his death.

AMMUNITION.

The manufacturers of Cartridges, &c., have, under date of 7th inst., advanced the quotation on this line of goods, naming the following prices, discounts and net prices, the terms being that bills are payable on the 10th of month following purchase, there being an additional 2 per cent. discount for cash in 10 days from date of invoice:

Rim Fire Cartridges, .22 cal.	dis. 60
Rim Fire Military Cartridges, .22 cal.	dis. 15
Cent. Fire Cartridges, Pistol and Rifle, .22 cal.	dis. 40
Cent. Fire Cartridges, Military and Sport, .22 cal.	dis. 30
Blank Cartridges, except .22 and .32 cal., an additional 10% over above discounts	
Blank Cartridges, .22 cal.	\$1.50, net
Blank Cartridges, .32 cal.	\$2.00, net
Primed Shells and Bullets, .22 cal.	dis. 25
Paper Shot Shells, 1st and 2d of S. G. qual. dis.	25.50
Sealed Combination Shot Shells, .22 cal.	dis. 25.50
Paper Shot Shells, Club, Rival, Climax, .22 cal.	dis. 40.50
Paper Shot Shells, Star Brand, .22 cal.	dis. 50.50
Brass Shot Shells, 1st quality, .22 cal.	dis. 60
Brass Shot Shells, Club, Rival and Climax, .22 cal.	dis. 65
B. B. Caps, Round Ball, .22 cal.	\$1.60, net
B. B. Caps, Conical Ball, Swaged, .22 cal.	\$1.75, net
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells), .22 cal.	\$1.90, net
All other Primers, all sizes	\$1.10, net
Gun Wads, Black and Pink Edge, Cartridge and White Felt.	dis. 20

In connection with this advance the manufacturers are elaborating the details of a plan by which they hope to secure its maintenance and to prevent the demoralization which has for some time prevailed in the market for these goods. The opinion is expressed that measures will be adopted by which regularity will be again given to this line of goods, and, while the details are not yet determined, it is intimated that there will be effectual restraints to prevent the cutting of prices. Concerning this, however, the trade will be able to judge more intelligently when the action of the association is completed. It also remains to be seen what effect the stock of Cartridges already in the hands of the trade will have upon the market.

LAWN MOWERS.

The following circular relating to the Pennsylvania and Quaker City Lawn Mowers has been issued by the Lloyd & Supply

Hardware Co., Philadelphia, announcing the terms on these machines for the coming season:

The new illustrated price lists of the Pennsylvania and Quaker City Lawn Mowers for the season of 1886 will be ready by January 1, with same list prices of 1885. The discount to the Hardware and agricultural trade on ordinary size Lawn Mowers will be 50 per cent. Parties buying 25 Mowers during the season, the discount will be 50 and 5 per cent. The extra size High Wheel Lawn Mowers in each case will be 5 per cent. higher in price. Horse Mowers, 30 per cent. Lawn Mowers shipped during the months of October and November will be due and payable January 1, 1886. Orders will be accepted and shipments made in the months of March or April and invoice made to date from May 1, 60 days, consequently fall due and payable July 1.

The Continental Lawn Mower Co., Philadelphia, have also issued a circular for the coming season, as follows:

The new illustrated price lists of the Continental Lawn Mower for the season of 1886 will be ready by January 1, with same list prices of 1885. The discount to the Hardware and agricultural trade on ordinary size Lawn Mowers will be 50 per cent. Parties buying 25 Mowers during the season, the discount will be 50 and 5 per cent. The extra size High Wheel Lawn Mowers in each case will be 5 per cent. higher in price. Lawn Mowers shipped during the months of October and November will be due and payable January 1, 1886. Orders will be accepted and shipment made in the months of March or April and invoice made to date from May 1, 60 days, consequently fall due and payable July 1.

ITEMS.

The Central Stamping Co., 25 Cliff street, New York, have issued a printed notice to the effect that the discount from their March 1 list will be 30 per cent., instead of 33 1/2 per cent. Sidney Shepard & Co., Buffalo, N. Y., make a corresponding announcement, mentioning that their discount on Stamped Ware, instead of 33 1/2 per cent., as heretofore, will be 30 per cent., subject to change without notice.

Butterfield & Co., Derby Line, Vt., manufacturers of Blacksmiths' Stocks and Dies, are selling these goods to the General Hardware trade at a discount of 25 and 5 per cent. Reece's Patent Screw Plates are offered at the same discount.

R. R. Rouse, Indianapolis, Ind., desires to mention that the sale of the R. R. Rouse Mfg. Co.'s establishment has nothing to do with his regular business. The manufacturing of Driven Well Supplies and Tools and his patent specialties he still continues at his old stand.

Our readers will observe among the special notices on page 20 the card of Thomas Laughlin & Son, Portland, Me., in which they call attention to a lot of Steel Nails, on which they can make immediate delivery, and concerning which they will be pleased to receive inquiries.

Efforts are being made by some manufacturers to advance the price of some Cast Iron Goods which are regarded as being very low. Among these may be mentioned Cast Butts, Well Wheels, Casters, &c., but as yet such advance is not general.

In one of our exchanges we find the announcement of the marriage of Joseph C. Ehart, junior member of the Hardware House of Joseph Ehart & Son, Fort Madison, Iowa, an enterprising and successful young man, and Miss Ella Smith, daughter of Joseph A. Smith, cashier of the Bank of Fort Madison, and well known in commercial circles.

We are in receipt from John P. Lovell's Sons, Boston, Mass., of an exceedingly complete catalogue and price list of their Guns, Rifles, Revolvers, Fishing Tackle, Sporting Goods and Police Equipments, which they are about to issue to the trade. It also contains a description of their Side-Snap Champion Hammerless Single Breach-Loading Shot Gun, to the merits of which they direct special attention as a new article which they are about to put on the market. Their Safety Double-Action Revolver is also prominently represented, the special feature of which is that, after firing the Revolver, by throwing open the gate the cylinder swings out to the right, when, by pressing the cylinder down on the base-pin, the exploded cartridges are instantly extracted. It is referred to as possessing the advantages of any Revolver in the market with patent self-acting shell ejector, extracting all the empty shells by one motion, while the price is much lower than those of other makes. Bean's Patent Police Equipments are prominently represented as a leading line, and in addition to those with which the trade are familiar we find Bean's Giant Handcuffs, a new article, the construction of which is explained and the list prices given. A circular is also issued relating to the Lovell Roller Skate, in which special attention is given to the Bon Ton and Bay State Roller, the special features of which are explained. The Bon Ton Roller is described as made of alternate disks of rawhide and semi-elastic fiber, with automatic lubricating chamber and securely clamped by screw-thread wires. It is claimed to be very much more durable than the wooden rolls. The Bay State Roller has a metallic center and a semi-elastic fiber bushing. For these goods John P. Lovell's Sons are sole agents for the United States and Canada.

The Clinton Wire Cloth Co., Clinton, Mass., advise us that at this time they have a large force of mechanics employed setting up 24 1/2-inch looms for weaving fine Wire Cloth, known as Mosquito Netting. The company have recently erected a new mill, in which

these looms are now being set up. It is claimed that the new looms are much better adapted for weaving fine Cloth than any heretofore constructed. About half the new machinery is in operation, and the balance, it is expected, will be in motion by the first of next month. No expense has been spared in providing the best sanitary appliances through the entire building, and the manager, after examining the best plants of Wire-weaving machinery, both in this country and abroad, expresses the opinion that this new mill is unexcelled by any. Then, referring to this line of manufacture in general, he says:

The fact is, we are far in advance of any other country in the matter of weaving, except in the exceedingly fine meshes, perhaps from 150 to 200. The palm must be awarded to the old hand-weavers of France for making such delicate webs. This indeed seems to be an appropriate name, as the wire used for such work scarcely exceeds the size of the material used by the spider in making its web.

The National Cash Register Co., Dayton, Ohio, are manifesting commendable enterprise in the manner in which they describe the special features of their Register in illustrated and readable circulars and posters, thus bringing them widely to the attention of the trade. It is also a matter of interest that in addition to their sale of the Registers in this country they are making frequent shipments to Europe—Germany, France and England being mentioned as countries from which orders have recently been received.

THE STANLEY WORKS.

New Britain, Conn., and 79 Chambers street, New York, issue the following discount sheet, applying to their catalogue of 1879. It is some time since the issue of their last, and the prices given below are intended to bring their quotations up to date, and thus represent the present condition of the market. On goods marked with an asterisk a change has been made in list and discount. An additional discount of 2 per cent. for cash if paid within 10 days from date of invoice is made on the whole line.

Page in 1879 catalogue.	Dis. per cent.
2-3, Bronzed Capped Butts, with Tips, No. 200.	40.50
4-5, Bronzed Capped Butts, Ball Tips, No. 201, same list and finish as No. 200.	40.50
6-7, Bronzed Capped Butts, Ball Tips, lined, No. 202.	40.50
8-9, Bronzed Capped Butts, Steeple Tips, No. 203.	40.50
10-11, Bronzed Capped Butts, Steeple Tips, No. 204.	40.50
12-13, Bronzed Capped Butts, Steeple Tips, No. 205.	40.50
14-15, Bronzed Loose Joint Butts, Steeple Tips, No. 206.	40.50
16-17, Bronzed Loose Joint Butts, Ball Tips, No. 207, same list and finish as No. 206.	40.50
18-19, Bronzed Loose Joint Butts, Ball Tips, lined, No. 208, same list and finish as No. 206.	40.50
20-21, Bronzed Loose Joint Butts, Steeple Tips, No. 209, 210.	40.50
22-23, Bronzed Loose Joint Butts, Ball Tips, No. 210, same list and finish as No. 209.	40.50
24-25, Bronzed Loose Joint Butts, Ball Tips, lined, No. 211, same list and finish as No. 209.	40.50
26-27, Bronzed Loose Joint Butts, Ball Tips, No. 211, same list and finish as No. 210.	40.50
28-29, Bronzed Loose Joint Butts, Ball Tips, lined, No. 212, same list and finish as No. 210.	40.50
30-31, Bronzed Loose Joint Butts, Steeple Tips, No. 212, 214.	40.50
32-33, Bronzed Loose Joint Butts, Ball Tips, No. 213, same list and finish as No. 212.	40.50
34-35, Bronzed Loose Joint Butts, Ball Tips, lined, No. 214, same list and finish as No. 212.	40.50
36-37, Bronzed Loose Joint Butts, Ball Tips, No. 214, same list and finish as No. 214.	40.50
38-39, Bronzed Loose Joint Butts, Ball Tips, lined, No. 215, same list and finish as No. 214.	40.50
40-41, Bronzed Loose Joint Butts, Acorns, No. 216.	40.50
42-43, Bronzed Loose Joint Butts, Acorns, No. 217.	40.50
44-45, Bronzed Loose Joint Butts, Acorns, Nos. 218, 220.	40.50
46-47, Bronzed Loose Joint Butts, Acorns, Nos. 219, 221.	40.50
48-49, Bronzed Loose Joint Butts, Acorns, No. 220.	40.50
50-51, Bronzed Loose Joint Butts, Nos. 222, 223.	40.50
52-53, Bronzed Loose Joint Butts, No. 231, Ball Tips, Double Washers, same list as No. 206.	40.50
54-55, Bronzed Loose Joint Butts, Nos. 232, 234.	40.50
56-57, Bronzed Loose Joint Butts, Steeple Tips, No. 235.	40.50
58-59, Bronzed Loose Pin Butts, Ball Tips, No. 237, same list and finish as No. 236.	40.50
60-61, Bronzed Loose Pin Butts, Ball Tips, lined, No. 237, same list and finish as No. 236.	40.50
62-63, Bronzed Loose Pin Butts, Steeple Tips, No. 238.	40.50
64-65, Bronzed Loose Pin Butts, Ball Tips, No. 239, same list and finish as No. 238.	40.50
66-67, Bronzed Loose Pin Butts, Ball Tips, lined, No. 240.	40.50
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27. Tinned Light Narrow Butts, No. 1852.....40
 28. Tinned Narrow Butts, No. 1854.....40
 29. Tinned Screws, No. 1356.....20
 Thomas Laughlin & Sons, Portland, Me., who are known as Block manufacturers, advise us that they have just been awarded the contract for 2000 feet of Railing for the Portland breakwater, being the lowest bidders therefor among eight competitors.

The Patton Mfg. Co., Columbus, Ohio, send out their new illustrated catalogue and price list showing the line of Enamelled Tin Tinned, Round and Plain Hollow-ware which they manufacture. It is illustrated and conveniently arranged. As recent additions to their line we notice the Patent Revolving Waffle Iron, which is made in several sizes, and the Favorite Damper, to which we have already directed the attention of the trade. The company have recently added a new foundry, 328 x 74 feet, and increased their working force about 75 men, making the number now employed 250.

The Alford & Berkele Co., as agents for the New England Specialty Co. for New York, New Jersey, Delaware and the West, issue a circular illustrating Leavitt's Improved Screw Driver, on which they give the following list prices per gross, which are subject to a discount of 25 per cent:

Inches.....	1 1/2	2	3	4
Per gross.....	\$4.50	3.75	8.83	10.83
Inches.....	5	6	8	10
Per gross.....	\$13.38	15.88	23.38	30.67

14 and 2 inch are packed in boxes of two dozen each, all the other sizes being in one-dozen boxes. In barrels, 14-inch, \$2.33; 2-inch, \$3.50.
 Kitchen Knives, 2 doz. in box, per gross..... \$4.17
 Shee Knives, 2 doz. in box, per gross..... 5.00
 Can Openers, 1 doz. in box, per gross..... 6.97
 Can Openers, in barrels, per gross..... 5.83

ARRANGEMENT OF HARDWARE STORES.

The following letter from a traveler will be read with interest, relating as it does to a part of the store to which our other correspondents have scarcely alluded. Many of our readers will recognize the accuracy of his description of the office of many a Hardwareman, as also the truth of his remarks with reference to the importance of having

dictating their manner of arranging a store of this size. They suggest that it would be desirable to have a store 44 x 100, with skylight in center. Referring to some details of its arrangement, our correspondents suggest:

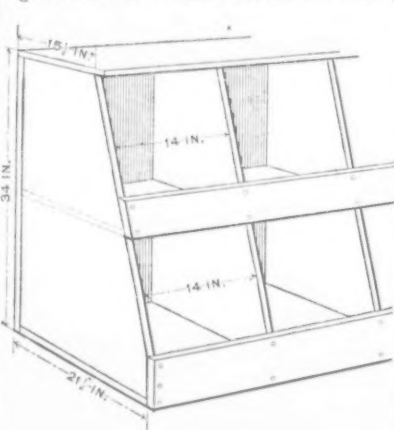
The front is of plate glass, the bottom of glass being 18 inches from sidewalk. Base shelf in show windows 11 inches from floor. Door recesses 3 1/2 feet deep, and the same depth for show window base shelf. Stairs should be located in the rear, as front space is too valuable. We cover our shelves with a wooden lid, to raise up and drop down on hinges, and place samples on the lids. We like this much better than boxes, for when boxes are used they have to be made of different sizes, and some so large as to be cumbersome. In the accompanying diagram we indicate the plan of our shelving. Shelves should not be less than 18 or 20 inches deep. Our upper shelves are 8 feet from the floor. We do not find this very inconvenient, as we put such goods as are seldom called for on the upper shelves. As a matter of taste, would not have them so high. We show Stoves on second floor; would not have them in the store on any consideration, on account of dirt and stove blacking. We exhibit them on long platforms 3 1/2 feet wide and 3 inches high, and give each Stove plenty of space, so that it may be shown on all sides; but the best place to keep Stoves is in some other fellow's store. We do not think much of the Stove trade.

There should be plenty of light, with light fixtures so constructed as not to cast shadows. Ash is a good material for flooring, and counters and shelving may be made of cherry. Color is a matter of taste, but it must be borne in mind that all light colors soon soil in a Hardware store. The dumb-waiter or elevator should be kept in the most convenient and out-of-the-way place. In regard to a rack or showcase for the display of goods in the middle of the store, we would have nothing in the middle of the store over 3 feet high, nor anything to prevent an unobstructed view of the shelves on both sides from the center of the store. We dislike to crowd our floor space. In crowding the center of a store, it is almost impossible to prevent

presume there is a better way, but we have not got onto it yet. We keep Wire in shop on third floor. Carriage Bolts are kept in boxes made to fit the shelves and properly labeled; Screws in small tin boxes and labeled. Such goods as Nails, Butts, Twines, Straps and T Hinges, Wood Handles, Horse Nails, Horseshoes, &c., do not need much display.

In the following diagram we have a plan of a Box to be used in the sale of Horseshoes, which is thus described by our correspondent:

The inclosed is a drawing of a Box that I have used for a number of years for retailing Horseshoes. It holds five sizes of Shoes.



Horseshoe Box.

forward in the upper and hind in the lower tills. The top is very convenient to display a number of kinds of goods, such as Vises, &c. The Horseshoe Box is made of 3/4-inch pine and is painted and grained.

Our correspondent then adds, as relating to the general plan of store:

I notice that one of the points you inquire about is rear lights. I prefer two good-sized windows and a double sash door, the door having 5 feet opening. This is as I

the arrangement of stores, mentions as a good size of room 60 x 105 feet; ceiling, 14 feet high. He does not believe in the desirability of having show-windows, as they spoil more goods than they sell. Would have counters only on one side of store, and a wide base shelf on the other side, with Nail bins below. He considers it desirable to have sample boxes for all goods, as he samples everything, finding that sales are increased by customers seeing and buying what they otherwise would not think of. Shelves should be adjustable, and shelving should run almost to the ceiling and have connected with it a railroad with movable step-ladder to shove back and forth along the shelving. All goods should be shown in the same room. He recommends Southern pine as a good material for floors, and hardwood for top of counters, the shelving to be of pine, oak grained. Boxes containing shelf goods he would have green. For Screws and Bolts he uses Westphal's patent Screw and Bolt Case.

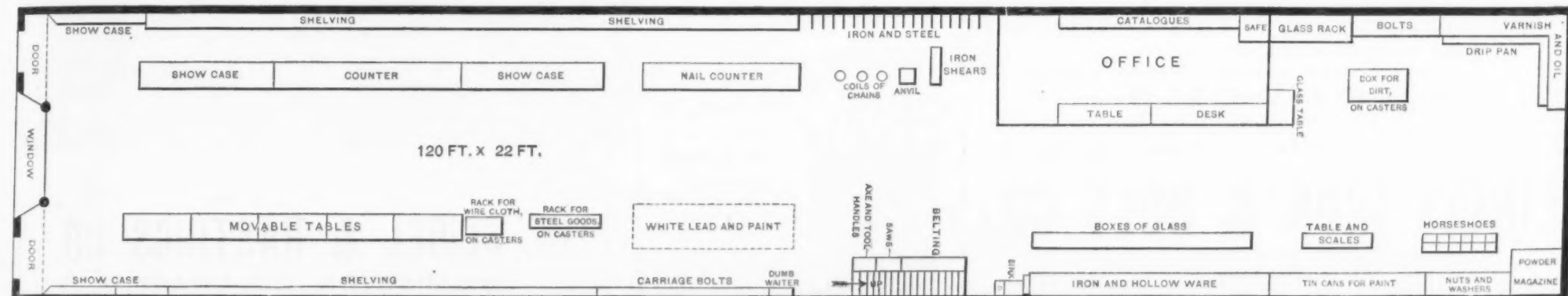
Referred to Our Readers.—The matters mentioned below are brought up by our correspondents as points on which suggestions would be of service to them:

1. Several Hardwaremen have written to us expressing their interest in this discussion, but allude to the fact that they are unable to apply many of the plans suggested on account of their lack of room, which makes the first consideration with them to be how to accommodate the goods they are obliged to carry in stock, and not giving them much opportunity to adopt the methods of display or storing which are theoretically the best. Undoubtedly this is a problem which many of our readers have to solve, and we take pleasure in directing especially the attention of the trade to this question—how room can be economized in stores which are already crowded with goods. What plans can our readers suggest by which in the smallest space the most Hardware can be most advantageously kept.

ziers, 15¢ for Bolts, and 18¢ for Bottoms. From London we are cabled this afternoon that the market is a little weaker, Chili Bars ranging from £38. 15/ to £39. 5/.

Tin.—The consumption of Tin has been falling off all along at such a rate since October that, while shipments to Europe remain steady, the immediate future of the Metal is now looked upon with more than usual misgivings, and it is apprehended that London may suddenly go off to below £90. The spot value in New York is to-day \$20.12 1/2 @ \$20.20; November-December, \$20.05 @ \$20.10, December 20¢, January 20¢, and February \$19.95, at which figures it is offering, the tendency remaining downward at the close. London cables this morning £90. 12/6, spot, and £91, three months. This afternoon our cable dispatch states that the market is weaker. Tin Plates.—The market here has been steady on Charcoal, but dull and lower on Ternes and Cokes. We quote toward the close, large lines, ordinary brands, 7¢ box: Charcoal Bright, \$5.10 @ \$5.15; do Ternes, \$4.40 @ \$4.50; Coke Tin, \$4.47 1/2 @ \$4.60, and do Ternes, \$4.30. Liverpool is also a shade lower, and quotes per cable: Charcoal, 16/6 @ 17/, and Coke, 14/6 @ 15/. From London we are told that the market is not so steady.

Lead.—The market is unsettled. Statistically it is strong, there being little available Lead on the spot, and 150 tons sold at \$1.20, Common Domestic, while Corroding is firmly held at 1 1/4¢. The last sale of Common "to arrive" from the West in January-February was made at the close of last week, 200 tons, at 4¢, but since then none can be had at that figure. About the activity now being displayed in erecting new plant for Lead mining a recent issue of the Leadville Herald states as under: "The cost of the mining machinery now in course of erection in Leadville will foot up nearly \$200,000. Over \$100,000 were expended for the same purpose last spring,



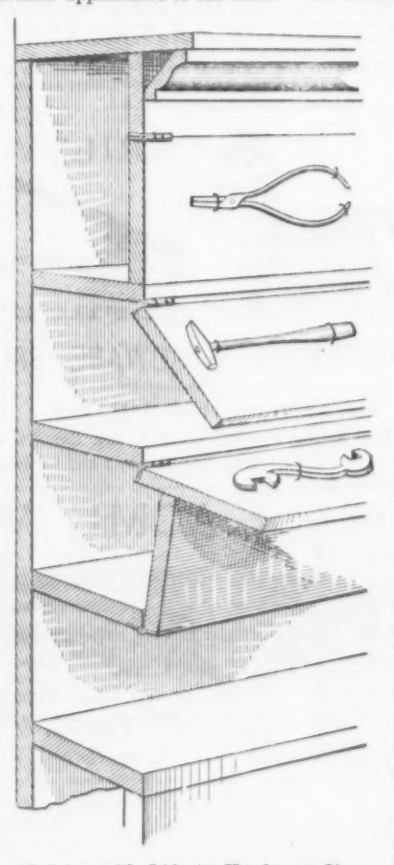
Arrangement of Hardware Store 22 x 120 Feet.

a good arrangement and order in this department:

I have read of late with great interest your frequent communications in regard to the arranging of Hardware stores, and think your correspondents have hit upon some very good ideas. But on one very important part of the business, which is often the most neglected, nothing has been said, and that is the manner in which too many of our Hardwaremen keep their office. Now, if I were in the retail trade, which I was for 15 years, I would have an office in the rear or center of my store, and have it inclosed with glass above the wainscoting, situated in a place which would permit me to see to the entire store as I stood at my desk. I would make it as neat and attractive as I would my house, and have a comfortable seat to offer a visitor, and not be obliged to invite him to take the "soft end of a Nail keg." In the next place I would have a system of keeping invoices and other business papers which would allow me to place my hand upon a paper, no matter what the date, in an instant. I know of no better convenience for filing papers than the Shannon file. As a lover of order I can but deplore the manner in which some of our merchants, especially the Hardwaremen, keep their invoices and business papers. I had occasion a short time since to go through a Hardwareman's invoices for a little over a year back. His invoices, from A to Z, were all hung promiscuously upon a large wire hook, making a bundle which would nearly fill a bushel basket. The writer of this spent nearly a half a day looking for the invoice in question. Another firm have a method of stuffing their invoices in pigeon-holes, and usually forget which hole they put their last invoice in, and write back for a duplicate. Now, if our Hardwaremen would adopt some plan of filing away papers there would be less occasion for errors, and time and money saved in ransacking for bills and receipts. Another very convenient fixture for the office is a scrap-book, in which are pasted useful Hardware lists and circulars, with an index in the front which enables one to find a circular of outside goods at a glance. I think a great deal can be said upon this matter, and I would like to hear from others interested in this subject.

We give herewith a diagram showing the arrangement of a Hardware store in Michigan, which will indicate to our readers the manner in which the space at command is utilized. The store represented has a width of 22 x 120 feet. The front 80 feet is three stories high, and the rear 40 feet is one story, giving a fine skylight. Our correspondents write that they dislike rear windows if light can thus be obtained from above, on account of danger from burglars, who always show a partiality for Hardware stores. They mention, however, the importance of having plenty of light. In sending this plan they do not refer to it as that of a model Hardware store, but rather as in-

giving the store a shoveled-in appearance, and if the space is too much crowded it is apt to make customers feel that they are in the way. To give a full appearance to the store is not half as important as to be able to show a customer what he calls for (with apparent comfort to yourself and him. We have a system of hanging light goods from the ceiling in such a way as to give an arched appearance to the store. We refer



Shelving with Lids in Hardware Store 22 x 120 Feet.

you to a communication sent some time ago, which you were kind enough to illustrate with a sketch, in regard to our method of keeping Dry Colors, Wall Finishes, &c. We do not think it can be excelled. We keep all Oils, Turpentine, Varnish, &c., in galvanized-iron tanks set on base shelf 16 inches from the floor, with long, shallow galvanized-iron pan under the faucets. Mixed Paints, which are largely sold now, are put up in tasty pails and buckets, and can be piled where most convenient. We keep Iron and Steel standing upright in the store, because we have no better place. Having it down the cellar makes too much running up and down. We

have it. I also prefer a store long from north to south, with front of store to the north. This gives the sun in the rear, where the desk is usually placed.

A Hardware house in Michigan, whose store was built last year, and which we judge from the description to be pretty well arranged, send us a communication giving answers to the general inquiries which we addressed to the trade in our issue of the 22d ult. Their answers are based upon a description of their store, and refer to the following points:

Dimensions of room, 30 x 85 x 14. For show-windows a straight front is preferred, 36 inches deep, such window being regarded as valuable for the display of goods. The store is shelved the whole length up to ceiling on a base 36 inches high, 26 inches wide, filled with convenient drawers. Counters on one side in three sections. Nail counter in rear. Nails kept in low bins on casters. Under counters, shelving divided in sections for Long Bolts, Strap Hinges, &c. Stairs should be in the rear of office which should be in center and on opposite side from the counters. Rear wall with two large windows and double door with transom. Side of store opposite the line of counters not shelved, but kept for displaying all goods that will hang up. Back of stairs, wide shelving for keeping Wash Boilers, &c. Shelves should be adjustable and filled with boxes for Shelf Hardware, with samples on front of box. Showcases on front counter for display of Cutlery, &c. In case Stoves and House Furnishing Goods are kept with a regular line of Hardware, would show both lines on the same floor. Stoves should be placed on elevated platforms in store. The desirability of having abundance of light, natural or artificial, is recognized. Floors of oak laid very narrow and oiled are preferred, and red oak polished for counters; pine for shelving painted white and properly trimmed. An elevator is indispensable, and should be placed in the rear opposite the back door. Would not have a rack or showcase for the display of goods running through the middle of the store. Paints and Oils to be kept in the basement, as also Iron, Steel, Wire, &c., which should be kept in racks. Screws, Bolts and such goods can most conveniently be kept in drawers with Shelf Hardware. Almost everything kept in stock should be shown by sample.

In the communication of Osborne & Ames giving a description of the arrangement of their store, which appeared in our last issue, a typographical error occurred by which our correspondents were made to say that there should be two counters and a large show-window between, when the correct statement would have been that there should be two entrances and a large show-window between, but as the diagram correctly represented it we trust that our readers were not misled.

A Hardwareman in Florida, referring to some of the general questions in relation to

2. One of our correspondents in the South remarks that he finds more trouble in keeping Strap and T Hinges, Cast Butts and Carriage Bolts than any other lines of goods, and writes us saying that he will value suggestions from some of the trade in regard to the best way of handling these lines.

3. A correspondent remarks that he has always much trouble with Shovels, Spades, Scoops, Forks, Hoes and Rakes, and is unable to find a satisfactory arrangement. In regard to handling these goods we have received few suggestions, and shall be glad to hear from the trade as to any methods they may find fairly satisfactory. The goods are bulky and awkward to handle, but we should like to know how our readers take care of them.

Metal Market.

Copper.—Since our last report Copper has been dull and weaker, Lake Superior being worth 10 1/2¢ @ 11¢ on the spot, and December-February, \$10.75 @ \$10.90; Baltimore, 9 7/8¢ @ 10¢, and Orford 9 1/4¢ @ 10¢. The feature of the week has been the dropping of Chili Bars in London below £39. The fluctuations there were as follows: November 5 and 6, £39. 5/; November 7, £39. 2/6; November 9, £39, and yesterday and this morning, £38. 17/6. Best Selected remained £44. 10/. We read in one of the Moscow papers, dated October 26, that the Russian Government intends to raise the duty on Copper Ore from \$1.80 per ton of 2240 lb to \$45.40 per ton. The London Mining Journal of October 31, in reviewing the condition of the Copper market there, expresses itself as follows: "Doubt and obscurity cover the future, and during the uncertainty holders are nervous, operators sensitive and a general uneasy feeling prevails. To-morrow or early next week the Chili charters for the last half of October will be known, the statistics will be published, and upon them the immediate future of the market may turn. But so far as matters now stand, and according to the statistics which are now known, supply is in excess of the demand, and pending the reversal of this fact prices are easy. Much has been said of a continuous increase in the American supply far above all trade requirements, but this is doubtless an exaggerated statement, and must be treated only for what it is worth; but still, for all that, there is the plain, simple fact that for the present the supply is too heavy, and until there is a change in this respect there is no hope for the market permanently recovering." For manufactures in this market dealers get 15¢ for New Sheathing Copper, 16¢ for Bra-

making a total so far this year of \$300,000, with fair prospects of the amount swelling to \$500,000 before the close of the year. The expenditure of \$500,000 in mining and milling machinery in Leadville proves that the mines of the district have been making money for their owners in the past, as nearly all the mines on which improvements are being made are owned by Colorado people. It also demonstrates the fact that mining is increasing in magnitude, and that deeper and more expensive work is in progress, with prospects of proportionately increased profits." In London Soft Spanish has not varied from £11. 5/. Manufactures are quoted as follows: Lead Pipe, 5 1/4¢ per lb; Sheet Lead, 6 1/4¢; Tin-Lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York, 3¢ per lb. Shot, Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ per lb extra. We are cabled from London this afternoon that the market is unchanged.

Spelter and Zinc.—As heretofore, the market for Common Domestic Spelter has been very quiet, yet firm, at \$4.40 @ \$4.60, and Silesian at 4 3/8¢ @ 5¢, nominally, while in London the latter gave way from £14. 5/ to £14. 2/6. Bertha Refined we quote 7 1/4¢ @ 8¢. Sheet Zinc.—Now that the active season for it is drawing to a close, the market has eased off slightly, and we cannot quote the same over \$5.70 @ \$5.90, Domestic. From London we are cabled this afternoon that the market is unchanged.

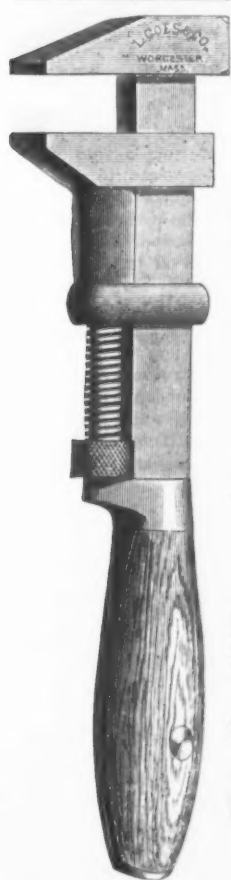
Antimony.—Has been dull, but steady; Cookson commanded 9 1/2¢ @ 9 3/4¢, and Hallett 8 1/2¢ @ 9¢. The latter remains unaltered in London at £35.

The United Nailers and the Western Nail Association.

As we go to press we learn that the Western Nail Association, at their meeting in Cincinnati to-day, refused to enter into negotiations with the United Nailers, as requested in a communication from their secretary.

New Orleans merchants are about to make an effort to regain the Rio coffee trade, which in former years constituted a prominent feature of their imports. They contend that two-thirds or more of all the Brazilian coffee imported into this country is consumed in the Southwest or the Mississippi Valley, and that New Orleans is the proper port and entrepôt.

Shipments of grain by canal will terminate for the season about the 15th or 20th inst. Shipments of grain by Lake will be continued till about the 28th inst., when most insurance policies on hulls and cargoes terminate for the season.



L. COES'
GENUINE IMPROVED
Knife Handle
PATENT
Screw Wrenches

MANUFACTURED BY
L. COES & CO.,
Worcester, Mass.

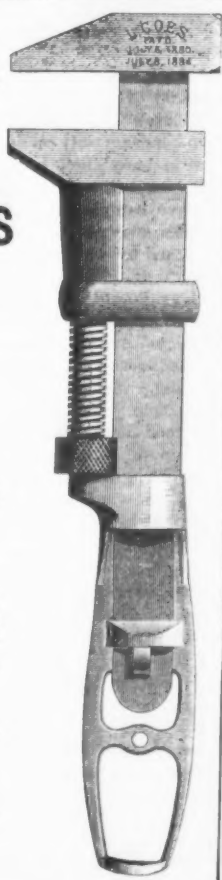
ESTABLISHED IN 1839.



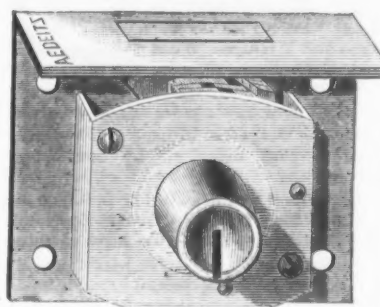
Sectional view illustrates our NEW
KNIFE HANDLE, showing Malleable
Iron Frame and Shank of Bar keyed
into position.
Straight Bar, Extra LONG NUT
FOR SCREW IN JAW.

The Best Made and Strongest Wrench in the Market.
Send for Illustrated Price List and Circular.

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Sole Agents.

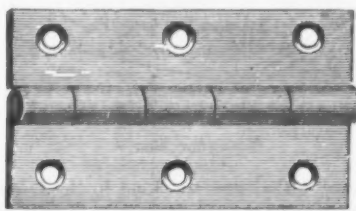


A. E. DEITZ.



No. 51 Lock.

DURRIE & McCARTY, Agents,
97 Chambers and 81 Reade Sts.,
NEW YORK.



W. & J. TIEBOUT,
MANUFACTURERS OF
BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.
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BELTING.

Unsurpassed for
Strength, Durability and
Cheapness.
Made to any Length,
Width and Strength.
Main Driving Belts.
Guaranteed to Run
Straight, Even Through-
out.
No Cross Joints, Un-
affected by Damp.
Clings well to the Pulley.
Has no equal. In fact,
is THE BELT.

MAIN BELTING
COMPANY,
S. W. cor. Ninth and Reed
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Also
248 East Randolph St.,
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BRYANT'S PATENT
EGG BEATERS.
SIMPLE, PRACTICAL,
NOVEL.

Retails at 20 Cents Each.

Price, \$2.00 per doz. and dis.

ADDRESS MANUFACTURERS:
PAINE, DIEHL & CO.,
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Philadelphia, Pa.



Amidon's Corner Brace.
WE MANUFACTURE
8 Different Styles
BIT BRACES.

Our BARKER BRACE is made in 4
grades, and our RATCHET BRACE
in 3 grades, the cheapest finish being just as sub-
stantial as the best. Send for Catalogue.

AMIDON & WHITE,
135 & 137 Main St., through to 10, 12 & 14 Quay St.,
BUFFALO, N. Y.

Palmer's Common Sense
FRAME PULLEY.



Saves the User 50 Cts. Per Doz.
Mortising all done with a bit.
No chisels or other tools re-
quired.
By hand—eight to one.
By power—twelve to one.
The only Frame Pulley the
Trade can handle with profit.
The only Pulley users will buy
after seeing this.
Send for Circulars.

MANUFACTURED BY
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Sole Eastern Agents,
PEABODY & PARKS, Troy, N. Y.



These Tool Handles are made of Rosewood, with Lignumvitae Cap, highly polished and of beau-
tiful appearance. The ferrule and jaws are heavily Nickel-Plated.
The Steel jaws will hold perfectly not only the Tools contained in the hollow handle, but all
other things from a needle to a mill file. No other Tool Handle in market will do this. It answers
the purpose of a small Hand Vise.
These Cuts are about one-half the size of the Handle and Tools which they represent. The
Tools are made from steel of the highest grade, tempered by men of great experience, honed to a
fine cutting edge, and are all highly finished. They are made for service, and will give the greatest
satisfaction. The Jaws in the handle shut over the shoulders of the tools (as seen in the cuts), so as
to make it impossible to pull them out when in use.

No. 4 Handle and 10 Tools, \$1.00 each.

Sent by mail, prepaid, on receipt of the price, or may be had at the same rate from all Hardware
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No. 74 CHAMBERS ST., NEW YORK.

CHAMPLAIN
Forged Horse Nails.
MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
Vergennes, Vermont.
HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST
NORWAY IRON AND WARRANTED.
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97 CHAMBERS AND 81 READE STREETS NEW YORK.
DURRIE & McCARTY, Sole Agents.

H. B. SEIDEL, President. W. HASTINGS, Vice-Pres. and Gen'l Mgr. E. T. CANBY, Sec. and Treas.
THE SEIDEL & HASTINGS CO.
WILMINGTON, DELAWARE,
New York Office, No. 221 Pearl, Corner Platt Street,
MANUFACTURERS OF
BEST CHARCOAL
BOILER PLATES,
AND PLATE IRON GENERALLY.
ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we
manufacture expressly for the Shells of Steam Boilers and stamp 50,000 pounds T. S. when
desired. One hundred and sixteen tests of this iron, made during the last three years by the
U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808
pounds to the sectional square inch, and an average reduction of area of the fractured
section of 30% per centum. Our prices are as low as the production of a good article will admit of.

VARIETY IRON WORKS.

ALFRED C. REX & CO.,
Manufacturers of
PATENTED HARDWARE SPECIALTIES AND NOVELTIES.
MAIN OFFICE AND FACTORY
FRANKFORD, PHILA.
BRANCH OFFICES:
126 Chambers St., New York, Chas. E. Spier, Mgr.
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New Spring Specialties—King Egg Beaters, awarded medal at American Institute, New
York; King Candle Lamp and Lantern, cheapest combination ever made.

STRONGEST ACME WRENCH AND BEST.

ALL STEEL CASE-HARDENED JAWS. WARRANTED. MANUFACTURED BY
OWSLEY BROS. & MARBLE, 784 to 794 Madison St., CHICAGO, U. S. A.
Description and Price List Furnished upon Application.

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WALPOLE EMERY MILLS,
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NIMICK & BRITTAN MFG. CO.,
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BUILDERS' FINE HARDWARE,
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M. MITHOFF & CO., Columbus, Ohio.

INDUSTRIAL ITEMS.

NEW HAMPSHIRE.

The Nashua Iron and Steel Co., Nashua, are putting up several additions to their buildings to accommodate their increasing business.

MASSACHUSETTS.

The striking glass-workers at the New England Glass Works, in East Cambridge, have returned to work, despite the great pressure brought to bear by the National Glass Workers' Union to keep them out. The works are running on full time.

Walter B. Guild, of 27 Kilby street, Boston, is starting a small machine shop for the manufacture of fine weighing scales and other patented specialties, and expects to be in the market for a small amount of machinery soon.

A new company have been formed in Clinton for the manufacture of furnaces for house heating purposes. This company will be known as the Ridgway Furnace and Stove Co., and start off with quite a large number of orders for furnaces on hand.

The Putnam Foundry and Machine Corporation, which commenced operations in Putnam over a year ago, are making a decided hit with their Plummer steam heater, and at present they are behind their orders. This foundry is a great convenience to all the mills in that section, for which they do a large amount of casting. Mr. Orrin Morse is the president and W. R. Barber is the treasurer and general manager.

The Parker Mill Nail Works, Wareham, began operations in full on Monday. Over 200 workmen are employed. Expensive arrangements are being made by the company to place several more machines in the mill. Eastern manufacturers are receiving large orders, which they do not seem anxious to fill, as they are kept busy supplying the home trade. They ask for a guarantee that if they raise wages now the workmen will be willing to accede to a reduction when the drop in price comes, as it inevitably will, when the Western mills get under full headway.—*Journal of Commerce.*

The Old Colony and Mount Hope Iron Works, of Somerset, have made an advance of 10 per cent. in wages, taking effect Monday, November 2. This was in response to a demand from the nailers, and prevents a strike, which the companies would deprecate while the nail trade is so active.

The Valley Machine Co., Easthampton, have increased their hours of labor to nine hours a day.

The insurance on the Prentiss Wire Mill, Holyoke, which was damaged by fire last week, has been adjusted for \$9472.

Spencer is soon to have a new industry in the shape of a concern for the manufacture of a patent hammerless gun.

RHODE ISLAND.

The Providence Steam Engine Co., Providence, sole builders of the improved Green engine, are now engaged in the construction and erection of 17 engines, with a range of 25 to 400 horse-power, and are also very busy in their boiler department. The company commenced running extra hours a few weeks ago, and report trade as being very active.

CONNECTICUT.

The Plume & Atwood Mfg. Co., Waterbury, purchased the first Westinghouse engine sold in New England, and now order a third engine of the same make of 45 horse-power.

The Meriden Bronze Co. are building a large addition to their factory.

NEW YORK.

While digging for the foundation for the new blast furnaces of the Albany and Rensselaer Iron and Steel Works, on Breaker Island, near Troy, the other day, several small pools of petroleum were encountered about 20 feet from the surface. The opinion is held that oil in paying quantities would be found if a well were sunk, and a company are about to try the experiment.

NEW JERSEY.

The managers of the Cumberland Nail and Iron Works, Cumberland, announce that after November 16 an increase of 5 per cent. in wages will be paid to the hands in their various mills. This company resumed operations about a month ago, when a six months' strike was ended by an increase of 10 per cent. in wages. They employ 400 hands.

PENNSYLVANIA.

No. 3 Furnace of the Crane Iron Works, Catawqua, has been relighted, and on Wednesday of last week the blast was put on the same. This makes four furnaces in blast.

It is reported that a rolling mill to manufacture iron hoops by the use of recently patented and highly-improved machinery is to be established at Milton.

The Keystone Rolling Mill, Reading, commenced running double turn last week. The mill was started up the beginning of October, after being idle for several years.

The operators of the Sunbury Nail Works, at Mount Carmel, have announced an advance in the wages of nailers and feeders of 10 per cent., dating from November 1. The demand is so brisk that the Northumberland Mills were compelled to decline an order for 50,000 kegs.

Northampton Furnace, near Freemansburg, which was built in 1872 and leased for a term of years by the Bethlehem Iron Co., will shortly be put in blast, the company having released it. The stack has been idle for several years. The work of preparing it for blast was commenced last week.

The Glendon Iron Co.'s No. 3 Furnace was put in blast last week, after being idle about three years. The company have again increased their force of workmen, and there is talk of preparing another stack for service.

Sheridan Furnace, which had been banked for a week for the purpose of making an attachment to a new set of boilers made by Oert & Co., of Lebanon, have started up

again. The iron produced by these two stacks averages about 700 tons weekly, which is being shipped away as fast as made.

A stack 70 feet high will be erected at the Reading Hardware Works. Twenty new churns will also be put in the new foundry and other improvements will be made.

The machinists at the shops of the Reading Railroad Co., in Reading, who were put on 10 hours a day two weeks ago, again went on eight hours last week.

The Thomas Iron Co. shipped one day week before last from Hokendauqua 620 tons of pig iron. The Crane Iron Co. shipped from their place one day 740 tons, being the largest shipment ever made in one day.

The puddlers employed in the Chesapeake Nail Works, at Harrisburg, and also in the Duncannon Iron Co., at Duncannon, have made a demand for an increase of 50 cents per ton. We are informed that the increase will not be granted.

The Pennsylvania Steel Co., at Steelton, produced at their furnaces during the month of October 13,687 tons of iron.

Lentz, Lilly & Co.'s collieries, near Shenandoah, will resume work on Monday, the operators acceding to all the demands of the striking miners. The men have been on a strike all summer. The number employed is nearly 400.

Sharpsville Furnace, which has been out of blast for some time, will be blown in soon—possibly next month.

PITTSBURGH AND VICINITY.

W. D. Wood & Co. have decided that the additional building to be erected at their forge will be an iron one, and the contract has been awarded to W. B. Scaife, Sons & Co., of Pittsburgh, who will commence work as soon as the foundation is completed. This addition will be 66 x 76 feet, and six new heating furnaces and two mammoth hammers used in polishing the sheet iron will be built in the additional building. This will necessitate the employment of about 50 men in the new department. It is not yet known whether the new works will be finished and ready for operation by spring. The work of excavating for the foundation will be commenced at once.

All departments of the Black Diamond Steel Works are on double turn.

Bryce, Higbee & Co. completed their new factory at Homestead on Saturday last and put fire in the furnace. They will thus be able to fill orders more promptly than they have been doing. Trade keeps very active with them.

The Westinghouse Machine Co. have received an order from the Otis Iron and Steel Co., of Cleveland, Ohio, for four Westinghouse engines of 200, 35, 25 and 8 horse-power respectively. This is the tenth order received from the Otis Co. within three years. The 200-horse-power engine is 18 x 16 inches, and will be coupled directly to a train of rolls making 300 revolutions.

The Wilson Snyder Mfg. Co. are increasing their facilities by the occupying of an additional building of 100 x 120 feet, being the foundry formerly used by the Breed & Edwards Plow Works. The increase of shop-room is rendered necessary to supply their increasing trade.

The Pittsburgh Steel Casting Co. report a healthy increase of business, their output of refined Bessemer steel billets and castings for the first 10 months of 1885 being 4116 tons in excess of their output for the 12 months of 1884.

Messrs. A. Garrison & Co., of Pittsburgh, have cast for Park Bros. & Co., proprietors of the Black Diamond Steel Works, a chilled-iron roll weighing 16 tons. This is the fourth roll of this kind that Garrison & Co. have cast for Park Bros. & Co. The four are the largest rolls in the world, the last being a spare one to replace any of the others which may get out of order. They are used for rolling steel plates, and measure 32 inches in diameter and are 9 feet 7 inches in length.

Last week a party of 16 green glass bottle blowers, principally from the Southside, left Pittsburgh for Newark, Ohio. They go there to work in Everett's Star Factory at that place, and will receive the old rate of wages.

The Bessemer Steel Co., of Braddock, have begun work on the order for 200 carloads of steel rails for the Union Pacific Railway.

The new window-glass house of Abel, Smith & Co., on the Southside, started up last week.

The employees of the National Rolling Mills, at McKeesport, have organized a mutual aid society similar to those already existing at Eastern mills, and have enrolled 50 members. Its object is to aid members in case of sickness or accident.

The Ihmsen Glass Co., Limited, on the Southside, have closed down for repairs.

The Homestead Steel Works are operated double turn to their utmost capacity in every department.

The 12-inch mill, the 10-inch mill and the hoop mill of Graft, Bennett & Co.'s iron works, at Millvale, went on double turn last week. They have been idle for the past six months. The bar mill has been running single turn, but it went on double turn also. More than 100 men went to work.

The Shoenberger blast furnace, which has been in operation for 19 years, turned out 600 tons of pig iron week before last. This is the largest output in the history of the furnace.

It is stated that Oliver Bros. & Phillips are making 1860 tons of skelp iron for the National Tube Works Co. It is further stated that the latter company's plate mill has five months' work ahead, running double turn.

Moorhead Bros. & Co. have started their puddling forge on double turn and the plate-rolls have started on single turn, making pipe

iron, after a shut-down of one year and a half. Their bar, guide and nail-plate mills are all running on grooved skelp iron on single turn, turning out about 50 tons daily.

The National Tube Works of McKeesport, says the *News*, will likely be the successful bidder on an immense contract for supplying the new Independent Pipe Line, which will run from the Franklin oil field to New Castle Junction.

The Brownsville Glass Works have resumed operations after an idleness of many months.

The Rochester Board of Trade are looking up a site for the Pittsburgh Novelty Works and the Philadelphia Co-operative Glass Works.

J. J. Ulam has leased the Mulvaney Glass Works, between Sixteenth and Seventeenth streets, one of the largest glass works on the Southside, to Thomas Evans & Co., who are now making the necessary repairs and will blow glass before next January. These works have been idle since August, 1881.

The Pittsburgh glass-workers are expressing their indignation in no unstated way over the fact that the specifications for the new courthouse and jail in Allegheny County call for English or Berlin plate glass when plate glass is made in the county itself.

The Crystal Glass Co., of Pittsburgh, have purchased land for a works at Rankin Station, just below Braddock.

Thomas Wightman & Co. have put a tank furnace in their bottle house, at Saw Mill Run. This is the first in that section of the country.

It is reported that the Gleason Mfg. Co., of New York, are seeking an available site for a glass factory in Pittsburgh.

A statement in the daily papers is to the effect that the Volta Iron Co. have ceased to make fine sheet iron for special purposes at their mills at Apollo, on account of the slight protection afforded them by the present tariff. This is not strictly correct; they are still making light sheets, but at a very small margin, the low duty having compelled them to discontinue the manufacture of the very large sizes only. Their mills at Apollo are now running triple turn, and are putting out from 20 to 25 tons per day of light sheets, from 20 to 32 gauge. They use natural gas exclusively, and report that their product is better in quality and very much cleaner than when they used coal.

OHIO.

It is stated that George Summers, Sr., proprietor of the Russia Iron Mills, at Niles, who made an assignment, owing his employees \$17,000, can pay 50 to 75 cents on the dollar.

The glass-workers at Rodefer Bros. and at the Lantern Globe Works, at Bellare, are out on a strike.

The coal miners in the Bellaire district are all out on a strike for an increase to \$2.25 per ton, bank measure, an advance of about 1/2 cent per bushel, except at the following-named mines: Heatherington's upper works, Hoffman's, Pelky Bros., Charles Henry's, Sullivan & Hind's and Morgan's. These are all peddling banks, except Sullivan & Hind's, and the advance was conceded there only to supply the Baltimore and Ohio Railroad at that point. This company can secure coal sufficient in West Virginia and Pennsylvania, and, with this addition for local supply, the other mines will be kept idle until the men submit. There are not over 250 miners at work, and there are from 1000 to 1200 out on a strike. The operators insist that the advance will never be conceded.

Arrangements have been completed to put the Thomas Furnace, at Niles, in blast. The furnace has been idle for more than a year.

The Bellaire Nail Works are having extensive additions made to machinery and appliances, and the manufacture of bar iron, it is expected, will be begun soon.

The trustees of Brown, Bonnell & Co., of Youngstown, are offering to buy the outstanding claims against that firm at 50 cents on the dollar of original face value.

The Canton Cutlery Works were almost entirely destroyed by fire last week. Loss about \$15,000; insured for about \$7000. The fire caught from a stove in the office. It will throw 30 men out of employment.

The Edgerton Mfg. Co. have been incorporated at Edgerton to manufacture shovels, forks, broom handles, &c. The capital stock is \$15,000.

The coal operators of the Hocking Valley and Ohio Central regions, including the Columbus and Hocking Coal and Iron Co. and the Ohio Coal Exchange, held a meeting last week at Columbus, and decided by a unanimous vote not to grant the demand made by the miners at their State convention for an advance of 10 cents per ton for mining.

ILLINOIS.

The La Chappelle Glass Co., at Ottawa, will build a new furnace.

The addition to the machine shop of the Maywood Co., of Maywood, 40 x 80 feet in size, and the new foundry built for the company, 60 x 80 feet in size, are both in running order.

The Chicago Forge and Bolt Co. are remodeling the American Bridge Co.'s old works, which they have just purchased. All the buildings are being re-roofed and other necessary alterations are being made.

A contract for dryer and tank work which will require some 50 tons of iron has been booked by the Excelsior Machine and Boiler Works, of Chicago, which are running day and night on orders.

At the works of John Mohr & Sons, Chicago, 75 tons of steel and 125 tons of plate iron are now being worked into boilers. An addition, 50 x 100 feet in area and three stories high, is to be built to these works early next year.

The Belleville Nail Mill, at Belleville, which has been idle for several months, has resumed operations in the nail and rolling de-

partments, and the factory will soon be started. This will give employment to some 400 men.

The Aurora Silver Plate Mfg. Co., at Aurora, are running their works till 10 o'clock every night. This company have some very large orders on hand.

The Union Steel Co., Chicago, have contracted for an 800,000 gallons daily special boiler feed pump fitted with the Worthington pressure regulator.

Licenses of incorporation have been issued by the Secretary of State to the following companies, under the laws of Illinois: Chicago Incandescent Gas-Light Mfg. Co., capital stock, \$100,000; incorporators, C. G. Linington, C. M. Linington and C. S. McComas. The Chicago Gas Stove Co., capital stock, \$50,000; incorporators, Charles D. Hauk, Nelson A. McClary and James W. Whittemore. The Milan Wagon Co., at Milan, Rock Island County, capital stock, \$10,000; incorporators, John E. Blakemore, Herbert D. Blakemore, of Moline, and Adair Pleasants, of Rock Island. The Office Toilet Supply Co., at Chicago, capital stock, \$5000; incorporators, Frank H. Ray, E. A. Woodward and Albert E. Braymer.

INDIANA.

The Ohio Falls Car Works, at Jeffersonville, have recently bought about 1000 tons of pig iron, being Sligo, Missouri and Tecumseh, Ala., irons. This does not mean that the car works are in operation, but that they will start in just as soon as they get orders sufficient to justify a resumption. The finances of the company are said to be in the best condition, they having considerable capital lying idle. The workshops are in good order, and with quite a stock of well-seasoned lumber on hand the company are prepared to take advantage of the first demand for cars.

MISSOURI.

The Shickle, Harrison & Howard Iron Co., St. Louis, have just completed contracts for furnishing all the cast-iron pipes for new water works at Chippewa Falls, Wis.; Urbana, Ill.; Mattoon, Ill.; Monominee, Wis.; Moberly, Mo., and Marion, Iowa. At the present time they are filling contracts for Mexico, Mo.; Omaha, Neb.; Hot Springs, Ark.; Los Angeles and Sacramento, Cal.; Kansas City, Mo., and Olathe, Kan. Contracts now in hand assure them active work until January 1 next.

The first shipment of a large bulk of steel from the new Vulcan Works, at Carondelet, was sent East on Saturday. New men are daily being added to the force, and before long the superintendent of the works says fully 1000 hands will be kept busy day and night.—*Age of Steel.*

The Duggan-Parker Hardware Co., of St. Louis, are running full time, with plenty of orders.

The St. Louis Sash Weight Co. since starting up a couple weeks ago, upon the completion of repairs, are far behind their orders.

The St. Louis Vise and Tool Co. have sold three of their heavy steam drillers to the manager of two companies who are prospecting for lubricating oil in Eastern Kentucky. The oil so far taken out is said to be of very fine quality, and much superior to the Illinois product.

The Whitman Agricultural Co., of St. Louis, are soon to put a new corn sheller on the market.

The Granite Iron Rolling Mills of the St. Louis Stamping Co. received 600 tons of soft steel from Germany last week for the manufacture of steel sheets. Some Vulcan steel was also delivered at the works under an experimental order, the same to be rolled this week. The establishment continues to run triple turn.—*Age of Steel.*

VIRGINIA.

Crozer Furnace, Roanoke, is now making about 100 tons of pig iron a day, using Blue Ridge, Va., and Cranberry, N. C., ores and Pocahontas, Va., coke. Most of its product is marketed in and near Philadelphia.

WEST VIRGINIA.

The Ensign Mfg. Co., Huntington, are filling an order for 500 pairs of wheels on axles for the Wilmington and Weldon and Wilmington, Columbia and Augusta railroads.

TENNESSEE.

The Knoxville Car Wheel Co. are now turning out 75 wheels per day. They make every variety of chilled wheels for steam, street and mine railroads, and have lately added a department for the manufacture of mine cars complete. They have also built a machine shop, with tools as complete as any in Tennessee, and are prepared to do all kinds of repair work and setting up engines and other machinery in any part of East Tennessee. A specialty is also made of saws for mills in sawing marble, no doubt the first ever made by any machine shop in the South.

GEORGIA.

Rising Fawn Furnace (coke), the property of the Walker Iron and Coal Co., made in the month of October 3200 tons of iron of 2265 pounds, seven-eighths of which was foundry iron.

ALABAMA.

The new sheet-iron mill of the Birmingham Rolling Mill Co. has been finished and is in operation. The addition consists of a new battery of boilers and machinery. The company can turn out 5 tons of light sheet iron every 24 hours.

Work has begun on the buildings for the Birmingham Chain Works, and part of the machinery has been received. The bridge company at the same place are about ready to build.

The Capital City Street Railway Co., of Montgomery, are arranging to substitute electric motors for mules, having asked permission from the City Council to make the change.

Working time in the East Tennessee, Virginia & Georgia Railroad shops at Selma

has been reduced from ten to nine hours and pay cut accordingly. Dissatisfaction among the workmen is reported as the consequence.

Although pending the receiver's disposal of them the Anniston Car Works are not regularly in operation, an arrangement has been made to build a number of cars there for the East and West Alabama Railroad.

A contract for some \$3000 worth of iron-work on a new jail at Clanton has been awarded to R. W. Boland, of Birmingham.

On the 3d inst. President Bond, of the Queen and Crescent Road, signed a contract with the Elyton Land Co., of Birmingham, to plant railroad shops at that place on ground donated by the Land Co. Two years' time is allowed for the performance of the contract.

KENTUCKY.

The Norton Iron Works Furnace, at Ashland, is being repaired and will blow in soon.

The report that 24 machines had been broken by feeders at the Norton Iron Works, Ashland, is without foundation.

A corporation called the Kentucky Natural Gas Co. has recently been formed to supply Louisville with natural gas from a well, some distance south of the city, which is now burning and illuminates the country around for miles. Louisville has cheap gas already, as there are two rival companies operating, and the natural gas will still further reduce the cost. Should the supply prove sufficient the gas will come in competition with coal for heating purposes.

The Kentucky Stove Co. have enlarged their foundry and warehouse, making their building 150 feet front on Delaware street. They have put in numerous improvements during the summer, and are now working up to their full capacity on their special line of cooking and heating stoves.

The Louisville and Portland Canal is undergoing great improvements. The United States owns and operates the canal, and the last Congress made liberal appropriations for the work. The upper end is being widened and straightened for about 300 yards, necessitating the removal of large quantities of earth and rock. There are about 200 teams and 300 men employed, besides several lines of narrow-gauge railroads to carry off the stone. Eight or ten engines for hoisting, pumping and drilling are also employed. This canal is a very important waterway, as nearly every boat and all towns of barges pass through it on their way up and down the river. The Government has succeeded in satisfactorily improving and deepening the harbor above the dam, giving plenty of water at all times and affording safe moorings for all kinds of craft. Two dredge-boats are constantly kept at work removing deposits, which is carried off and thrown into the falls by dump barges. The three locks of the canal are very fine pieces of work, operated by steam, and under perfect control. No toll is charged on the canal, and the smallest boat passing through commands the attention of the officers as much as the largest steamer.

There is some talk of the Kentucky Rolling Mills, at Louisville, beginning work this winter, but nothing definite as yet is decided on.

TRADE PUBLICATIONS.

Non-Conducting Coverings.

The Chalmers Spence Co., of New York, have sent us one of their catalogues, in which we find interesting particulars concerning their well-known non-conducting coverings for steam-pipes, boilers, &c. Illustrations and price lists are given, and also directions for applying the coatings. Steam users will find some things of pecuniary interest in the pamphlet.

Power Transmitting Machinery.

The new catalogue of the Philadelphia Shafting Works, Philadelphia, Pa., supplies a mass of interesting trade particulars concerning power transmitting machinery, shafting, &c. It is fully illustrated.

The Hall Steam Pump.

The Hall Steam Pump Co., of New York, have issued an illustrated eight page circular relating to their duplex pump. It briefly sets forth the advantages of the pump and contains a number of flattering testimonials.

The Stevens Furnace.

A pamphlet recently issued by the Stevens Furnace Co., 30 Kilby street, Boston, Mass., supplies an illustrated description of the Stevens furnace, for which a number of advantages are claimed. Smoke prevention is one of the points to which attention is directed, in itself of sufficient importance to warrant careful examination. The furnace, it appears, is applicable not only to steam boilers, but also to heating apparatus, smelting works, &c. Results of evaporative tests made by Mr. Francis E. Galloupe, with externally-fired plain tubular boilers set with and without the Stevens furnace, are given, enabling the reader to form an idea of the advantages which the furnace offers.

Machinery and Tools.

The Brown & Sharpe Mfg. Co., of Providence, R. I., are distributing a new edition of their small catalogue. It is dated October 1, 1885, and differs in some respects from the former catalogue. Thus the Brown & Sharpe Co., owing to the increased number and variety of their machines, decided to use numbers instead of names, as heretofore, and the present catalogue accordingly furnishes an index giving the old name of each machine with its present number. In addition to illustrations and brief descriptions of a large number of different machines the catalogue contains many interesting little tables and scraps of general information.

HARDWARE.

[illegible]

Mouse, "Bonanza" P gross \$10 net

Moose, "Bonanza".....	\$ gross \$10.00
Mouse, Delusion.....	\$ gross \$18.00, dis 15 %
Rat, "Decoy".....	\$ gross \$10.00, dis 15 %
Ideal.....	\$ gross \$10
Cyclone.....	\$ dis \$5.25
Trawls.	
Lithrop's Brick and Plastering.....	dis 20 & 10 %
Reed's Brick and Plastering.....	dis 15 %
Dleston's Brick and Plastering.....	dis 20 & 10 %
Bridal.....	dis 25 %
Clement & Maynard.....	dis 25 %
Rose's Brick.....	dis 15 %
Brade's Brick.....	dis 25 %
Worrall's Brick and Plastering.....	dis 20 %
Garden.....	dis 70 %
Friers.	
Butter and Cheese.....	dis 25 %
Trucks, Warehouse, &c.	
Pearfield Block Co.'s list, 1882.....	do do do 40
Twine.	
No. 9, Flat Twine, 5 and 6 lb Balls.....	24c 31c
No. 15, " " 5 and 6 " ".....	22c 24c
No. 18, " " 5 and 6 " ".....	20c 22c
No. 24, " " 5 and 6 " ".....	20c 22c
No. 30, " " 5 and 6 " ".....	19c 21c
"Chalk Line, Cotton, 7 lb Balls.....	50
Mason Line, Linen, 5 lb.....	50
2-Ply Hemp, 5 and 6 lb Balls (Spring Twine).....	14c
2-Ply Hemp, 1 lb Ball.....	20
3-Ply Hemp, 1 lb Balls.....	25
Cotton Wrapping, 5 Balls to lb.....	14c @ 20
Whiting's Fly Jute, 5 lb Balls.....	11
Wool.....	55
Paper.....	15c @ 16
Cotton Hops—0, 9, 12 and 15 lb to doz.....	17
Vices.	
Solid Box.....	dis 50 & 10 @ 00
Varrels.	
Finster & Norris Double Screw.....	dis 15 & 10
Stephens'.....	dis 25
Parker's.....	dis 30 @ 25
Fence's.....	dis 35
Howard's.....	dis 40 %
Bonney's.....	dis 40 %
Sargent's.....	dis 100 & 5 @ 10
Merrill's.....	dis 15c @ 10
Sargent's.....	dis 60 & 10 %
Double Screw Lox.....	dis 40 %
Prentiss.....	dis 20 & 25
Stimpany's Adjustable.....	dis 40 %
Saws, Filers.	
Bonney's No. 2 & 3.....	\$ doz \$15.00, dis 40
Searns'.....	dis 40 %
Marked, Coppered, Nos. 0 to 18.....	\$ doz \$17.50, dis 35 %
Reading.....	dis 40 & 1
Wentworth.....	dis 20 & 10
Apleton's.....	dis 10 & 10
Bauer's Pipe Vises.....	dis 10
Washer Cutters.	
Johnson's Patent.....	\$ doz \$12.00, dis 30 & 10 & 10
Johnson's.....	\$ doz \$11.00, dis 35 %
Penny's.....	\$ doz Pol. \$14; Jap'd, \$10, dis 55 %
Bonney's.....	\$ doz \$10.00, dis 60 & 10
Bonney's.....	dis 30 & 10
Washers.—See Nuts and Washers.	
Wire Buckets, Galvanized.	
Hill's.....	\$ doz, 12 qt., \$3.50; 14 qt., \$4.50
Iron Clad.....	\$ doz, 14 qt., \$4—dis
Whitcomb's Flat Iron Band.....	\$ doz \$4.25
Walting's Wire Top.....	dis 10 & 10
Wire Wheels—Sln., \$1.85; 10 In., \$2.15; 12 In., \$2.50.	
Wire.	
Black and Copper, new list, Jan. 18, '84, dis 33% @ 30 & 10 % from—	
Market, Bright and Annealed, Nos. 0 to 18.....	dis 70 %
Market, Coppered, Nos. 0 to 18.....	dis 75 & 5 %
Market, Bright and Annealed, Nos. 19 to 20.....	dis 75 %
Market, Tinned, Tinned Hot, Nos. 0 to 18.....	dis 60 & 5 %
Stone Bright and Annealed, Nos. 16 to 18.....	dis 65 %
Stone Tinned, Tinned Hot, Nos. 16 to 18.....	dis 65 %
Stone, Bright and Annealed, Nos. 27 to 30.....	dis 70 & 5 %
Stone, Galvanized, Nos. 19 to 30.....	dis 55 %
Scion Tinned, Tinned Hot, Nos. 19 to 30.....	dis 55 %
Tinned Broom Wire, Nos. 18 to 24.....	dis 50 %
Annealed Fence, Nos. 8 & 9.....	dis 70 %
Picture Wire.....	\$ doz, 14 ft., \$1.00
Barb Fence.....	See Trade Tariff
Wire on Spools.....	dis 65 %
Maine Spooled Wire.....	dis 50 & 10 & 5 %
Cast Steel Wire.....	dis 55 %
Stub's Steel Wire.....	\$6.00 to \$6, dis 30 %
Steel Music Wire, Nos. 15 to 30.....	55c
Picture Wire.....	\$ doz, 14 ft., \$1.00
Barb & Fire safety Guards.....	\$ 1000 \$6.00, dis 25 %
Wire Clothes Lines, See Lines.....	
Green, drab and black, \$ 100 sq. ft.....\$1.85 @ 20 %	
Wrenches.—American Adjustable.....dis 45 %	
Excelsior for Stationary Tubs, No. E.....	dis 35 & 10
Baxter's Diagonal.....	dis 35 & 10
Coe's genuine.....	cash in 10 days, dis 60 & 5 %
Coe's Pattern, Malleable.....	dis 60 & 10 & 5 %
Coe's Pattern, Wrought.....	dis 75 & 10 & 5 %
Olford Standard.....	dis 70 & 10 & 5 %
Excelsior for Stationary Tubs, No. F.....	dis 35 & 10
Sterling Wrench, Wrought.....	dis 75 & 10 & 5 %
Sterling Wrench, Malleable.....	dis 80 % & 5 %
Bemis & Call's Patent Combination.....	dis 55 %
Bemis & Call's Briggs's Pattern.....	dis 25 %
Bemis & Call's No. 5 Pipe.....	dis 10 & 5 %
Aiken's Pocket Combination.....	\$6.00, dis 50 & 10 %
The Favorite Tinned Hot, No. 18 & 19 inch.....	\$ doz \$4.00, dis 40 %
Webster's Patent Combination.....	dis 55 %
Boardman's.....	dis 25 & 25 & 10 %
Always Ready.....	dis 25 & 5 %
Allicator.....	dis 40 & 10 %
Donohue's Engineer.....	dis 25 %
Acme, Bright.....	dis 60 & 5 %
Acme, Black.....	dis 45 %
Acme, Bicycle, 1/4 In.....	dis 40 %
Winners.	
Adams & Co., No. 3.....	\$30.00
Advance.....	30.00
Excelsior, for Stationary Tubs, No. E, 10-inch.....	39.00
Excelsior, for Stationary Tubs, No. F, 11-inch.....	43.50
Excelsior, with Folding Bench, No. 18, 10 inch.....	40.00
Excelsior, with Folding Bench, No. F, 11-inch.....	45.50
Leader.....	28.00
"Metropolitan," No. 2.....	30.00
Novelty, for Common Tubs, No. S, 10-inch.....	30.00
Universal, No. C, 2 1/2.....	34.50
Universal, No. 14.....	30.00
Universal, No. 2.....	35.00
Universal, No. 1.....	34.50
Universal, for Set Tubs, A,	

WHOLESALE METAL PRICES, November 11, 1885.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢; provided that no Bar Iron shall pay a less rate of duty than 30¢. Sheet, 11-0¢ to 15-10¢; Band, Hoop and Scroll, 1¢ to 1-40¢; Rod, Railroad Bars weighing more than 25 lb. yard, 7-10¢ of 1¢ lb.

Standard American Pig Iron.

Foundry No. 1 X..... 17.50 @ 18.50
Foundry No. 2 X..... 16.00 @ 16.50
Gray Forge..... 15.00 @ 15.50

No. 1 Scotch Pig Iron.

Carnbroe..... 18.50 @ 19.00
Coltness..... 18.50 @ 19.00
Shotts..... 18.50 @ 19.00
Glenarnock..... 18.50 @ 19.00
Gartshore..... 18.50 @ 19.00
Langloan..... 18.50 @ 19.00
Summerlee..... 18.50 @ 19.00
Dalmeny..... 18.50 @ 19.00
Eglington..... 18.50 @ 19.00
Clyde..... 18.50 @ 19.00

Rails.

Steel, at Eastern Mills..... 18.00 @ 18.50
Old Rails, Ts..... 18.00 @ 18.50

Scrap.

Wrought, Bar Iron from Store..... 18.00 @ 18.50

Common Iron.

1/4 to 1 in. round and square..... 1.6 @ 1.75¢
1 to 6 in. x 1/4 to 1 in. square..... 1.6 @ 1.75¢

Refined Iron:
1/4 to 1 in. round and square..... 1.85 @ 2.3¢
1 to 6 in. x 1/4 to 1 in. square..... 1.9 @ 2.4¢
Rods—1/4 and 11-16 round and sq..... 1.7 @ 2.3¢
Bands—1 to 6 in. round and sq..... 2 @ 2.5¢
"Burden's Best" Iron, base price..... 2.25¢
Burden's "H. B. & S." Iron, base price..... 2.25¢
Norway Nail Rods..... 5 @ 6¢

Sheet Iron from Store.

Common..... 2.70 @ 3¢
American..... 3 @ 3.5¢
R. G. Cleaned..... 3.5¢ @ 4¢

Nos. 10 to 16..... 2.70 @ 3¢
17 to 24..... 3 @ 3.5¢
25 to 36..... 3.12 @ 3.5¢
27..... 3.25 @ 3.5¢
28..... 3.37 @ 3.5¢

Galvanized, 10 to 30..... 5 @ 5.5¢
Galvanized, 31 to 36..... 5.5¢ @ 6¢
Galvanized, 37..... 6 @ 6.5¢
Galvanized, 38..... 6.5¢ @ 7¢
Galvanized, 39..... 7 @ 7.5¢
American Russia..... 10 @ 10.5¢
Russia..... 10 @ 10.5¢
American Cold Rolled B. B..... 5 @ 7¢

Iron Wire.

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ lb. or less, 4¢ ad. val.; valued above 4¢ and not above 7¢ lb., 2¢ lb.; valued above 7¢ and not above 10¢ lb., 3¢ lb.; valued above 10¢ lb., 3 1/2¢ lb. Extra—Steel Bars, Rods, &c., cold drawn, or polished, 1 1/2¢ lb. in addition to ordinary hot rolling, 1 1/2¢ lb. in addition to above; Steel Circular Saw Plates, 1¢ lb. in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Too, Steel, ordinary sizes, 3/4 to 3 inches, 10 @ 14¢
Admirable Sheets and Discs..... 8 @ 9¢
Magnet Steel..... 14 @ 15¢

English Steel.

Best Cast..... 10 @ 15¢
Extra Cast..... 10 @ 15¢
Circular Saw Plates..... 10 @ 15¢
Round Machinery, Cast..... 10 @ 15¢
Swaged, Cast..... 10 @ 15¢
Best Double Shear..... 10 @ 15¢
Blister, 1st quality..... 10 @ 15¢
German Steel, Best..... 10 @ 15¢
2d quality..... 10 @ 15¢
3d quality..... 10 @ 15¢
Sheet Cast Steel, 1st quality..... 10 @ 15¢
2d quality..... 10 @ 15¢
3d quality..... 10 @ 15¢

TIN.—Duty: Plates, Sheets, Tagger and Terne, 1¢ lb.; Bars, Block and Pig Iron, 2¢ lb.

Best..... 22 @ 23¢
Strait..... 22 @ 23¢
English..... 22 @ 23¢
Bar..... 22 @ 23¢

Charcoal Tin Plates.

1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50

Coke Tin Plates.

Best..... 10.50 @ 11.50
Ordinary..... 10.50 @ 11.50
1 C 10x14..... 10.50 @ 11.50
1 C 12x12..... 10.50 @ 11.50
1 C 10x28, gutters, 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112 sheets..... 10.50 @ 11.50

Terne Plates.

Prime Char. 2d. quality..... 10.50 @ 11.50
Coke..... 10.50 @ 11.50
1 C 10x14 M. F. 57..... 10.50 @ 11.50
1 C 10x14 Old Process..... 10.50 @ 11.50
1 C 10x28..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50

Tin Boiler Plates.

1 C 10x14 225 sheets for No. 7, 112 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50
1 C 10x14 225 sheets..... 10.50 @ 11.50
1 C 12x12 225 sheets..... 10.50 @ 11.50
1 C 10x28, 112..... 10.50 @ 11.50

COPPER.—Duty: Pig, Bar and Ingot, 4¢; Old Copper, 3¢; Manufactured (including all articles of which Copper is a component of chief value), 35¢ ad valorem.

Ingot, Lake..... 109 1/2 @ 11 1/2¢
Ingot, Baltimore..... 109 1/2 @ 11 1/2¢
Ingot Anchor..... 109 1/2 @ 11 1/2¢
Braziers' Copper, ordinary sizes, 16 oz. sq. ft. and over..... 16¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. sq. ft..... 18¢
Braziers' Copper, 10 oz. and 12 oz. sq. ft..... 20¢
Lighter than 10 oz. sq. ft..... 20¢
Circles less than 8 in. in diam..... 20¢
8 in. diam. and over..... 22¢
Segment and Pattern Sheets..... 20¢
Locomotive Fire-Box Sheets..... 19¢
Sheeting Copper, over 12 oz. sq. ft..... 14 1/2 @ 15¢
Bolt Copper..... 14 1/2 @ 15¢
Copper Bottoms..... 16 1/2 @ 17 1/2¢
Nickel-Plated sheeting..... 35¢ @ 37¢
Plating extra..... 37¢ @ 39¢
Flat Copper Boiler Bottoms or Fit Bottoms, cut to special sizes..... 21¢

Tinuing.

14x18, by the case..... 1/2 sheet, 8¢
14x18, less than case..... 8¢
For tinning both sides, double the above amount.

O'Neill's Patent Platinized Copper.

14 and 16 oz. and heavier, 3/4 By the case, 1/2 22¢
12 oz. and lighter..... 22¢

Boiler Sizes.

7 in., 14x22, 8 in., 14x26, 9 in., 14x30,
14 and 16 oz. and heavier, 3/4 By the case, 1/2 21¢
(And all sizes not over 30 in. wide.)
24x48 and 30x60..... 24¢
14 and 16 oz. and heavier..... 24¢
2 oz..... 24¢

Copper Wire.

Sheathing Metal, 1/2 lb..... 20¢ @ 21¢
Yellow Sheathing Metal, 1/2 lb..... 20¢ @ 21¢

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal;
Old English Gauge the Standard for Wire.

BRASS Manufacturers' Price List, January 17, 1884..... 1/2 30 @ 30 1/2¢
1/2 Pipe and Sheet, 3/4 lb..... 4 1/2 @ 4 5/8¢
Bar..... 4 1/2 @ 4 5/8¢
Pipes..... 6 1/2 @ 6 1/2¢

Block Tin Pipe..... 40¢
Tin Lined Pipe..... 10¢, dis 30¢
Sheet..... 7¢, dis 30¢
Shot, 1/2 bag..... Drop, \$1.50; Buck, \$1.75
Chilled Shot..... 7¢

ANTIMONY.

Hallet's..... 9 @ 9 1/2¢
Cookson..... 9 1/2 @ 10 1/2¢
SPELTER—Duty: Pigs, Bars and Plates, \$1.50

ZINC.

American, cash..... 4 1/2 @ 5¢
Bergenport..... 9¢
ZINC—Duty: Pig or Block, \$1.50 100 lbs.

Sheet, 2 1/2¢ lb..... 5.80 @ 6.00¢
600 lb. cases..... 5.50 @ 5.70¢
Zinc—Open..... 5.50 @ 5.70¢
Zinc Tubing..... dis. 10 @ 20¢

Zinc Tubing—Dis. 25¢.

Plain..... 27¢
Fancy..... 33¢
Scotch and Extra Patterns..... 36¢

MAHITT METAL.

E. U..... 6 1/2 @ 7¢
X X..... 10¢
J. B..... 15¢

WIRE.

Market Wire.—Put up in 68 lb. bundles.

Nos. 00 to 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

Bright Market Wire..... dis 70¢
Charcoal..... dis 50¢
Bale Wire, Nos. 7 to 12..... dis 65¢

Annealed Market Wire..... dis 70¢
Fence Wire, Nos. 9, 10, 11, 12, 13, 14, 15, 16, 17, 18..... dis 70¢
Grape Wire, Nos. 10 to 14..... dis 70¢
Coppered Market Wire..... dis 65¢
Bale Wire, Nos. 7 to 12..... dis 60¢
Galvanized Market Wire..... dis 60¢
Fence Wire..... dis 50¢

Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26
Cents..... 14 15 16 17 18 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36 37 38 39 40
Cents..... 28 29 30 31 32 33 34 35 36 37 38 39 40

Nos. 41 42 43 44 45 46 47 48 49 50 51 52 53 54
Cents..... 48 49 50 51 52 53 54 55 56 57 58 59 60

Nos. 55 56 57 58 59 60 61 62 63 64 65 66 67 68
Cents..... 58 59 60 61 62 63 64 65 66 67 68 69 70

Nos. 69 70 71 72 73 74 75 76 77 78 79 80 81 82
Cents..... 70 71 72 73 74 75 76 77 78 79 80 81 82

Nos. 83 84 85 86 87 88 89 90 91 92 93 94 95 96
Cents..... 82 83 84 85 86 87 88 89 90 91 92 93 94

Nos. 97 98 99 100 101 102 103 104 105 106 107 108 109 110
Cents..... 84 85 86 87 88 89 90 91 92 93 94 95 96

Nos. 111 112 113 114 115 116 117 118 119 120 121 122 123 124
Cents..... 86 87 88 89 90 91 92 93 94 95 96 97 98

Nos. 125 126 127 128 129 130 131 132 133 134 135 136 137 138
Cents..... 88 89 90 91 92 93 94 95 96 97 98 99 100

Nos. 139 140 141 142 143 144 145 146 147 148 149 150 151 152
Cents..... 90 91 92 93 94 95 96 97 98 99 100 101 102

Nos. 153 154 155 156 157 158 159 160 161 162 163 164 165 166
Cents..... 92 93 94 95 96 97 98 99 100 101 102 103 104

Nos. 167 168 169 170 171 172 173 174 175 176 177 178 179 180
Cents..... 94 95 96 97 98 99 100 101 102 103 104 105 106

Nos. 181 182 183 184 185 186 187 188 189 190 191 192 193 194
Cents..... 96 97 98 99 100 101 102 103 104 105 106 107 108

Nos. 195 196 197 198 199 200 201 202 203 204 205 206 207 208
Cents..... 98 99 100 101 102 103 104 105 106 107 108 109 110

Nos. 209 210 211 212 213 214 215 216 217 218 219 220 221 222
Cents..... 100 101 102 103 104 105 106 107 108 109 110 111 112

Nos. 223 224 225 226 227 228 229 230 231 232 233 234 235 236
Cents..... 102 103 104 105 106 107 108 109 110 111 112 113 114

Nos. 237 238 239 240 241 242 243 244 245 246 247 248 249 250
Cents..... 104 105 106 107 108 109 110 111 112 113 114 115 116

Nos. 251 252 253 254 255 256 257 258 259 260 261 262 263 264
Cents..... 106 107 108 109 110 111 112 113 114 115 116 117 118

Nos. 265 266 267 268 269 270 271 272 273 274 275 276 277 278
Cents..... 108 109 110 111 112 113 114 115 116 117 118 119 120

Nos. 279 280 281 282 283 284 285 286 287 288 289 290 291 292
Cents..... 110 111 112 113 114 115 116 117 118 119 120 121 122

Nos. 293 294 295 296 297 298 299 300 301 302 303 304 305 306
Cents..... 112 113 114 115 116 117 118 119 120 121 122 123 124

Nos. 307 308 309 310 311 312 313 314 315 316 317 318 319 320
Cents..... 114 115 116 117 118 119 120 121 122 123 124 125 126

Nos. 321 322 323 324 325 326 327 328 329 330 331 332 333 334
Cents..... 116 117 118 119 120 121 122 123 124 125 126 127 128

Nos. 335 336 337 338 339 340 341 342 343 344 345 346 347 348
Cents..... 118 119 120 121 122 123 124 125 126 127 128 129 130

Nos. 349 350 351 352 353 354 355 356 357 358 359 360 361 362
Cents..... 120 121 122 123 124 125 126 127 128 129 130 131 132

Nos. 363 364 365 366 367 368 369 370 371 372 373 374 375 376
Cents..... 122 123 124 125 126 127 128 129 130 131 132 133 134

Nos. 377 378 379 380 381 382 383 384 385 386 387 388 389 390
Cents..... 124 125 126 127 128 129 130 131 132 133 134 135 136

Nos. 391 392 393 394 395 396 397 398 399 400 401 402 403 404
Cents..... 126 127 128 129 130 131 132 133 134 135 136 137 138

Nos. 405 406 407 408 409 410 411 412 413 414 415 416 417 418
Cents..... 128 129 130 131 132 133 134 135 136 137 138 139 140

Nos. 419 420 421 422 423 424 425 426 427 428 429 430 431 432
Cents..... 130 131 132 133 134 135 136 137 138 139 140 141 142

Nos. 433 434 435 436 437 438 439 440 441 442 443 444 445 446
Cents..... 132 133 134 135 136 137 138 139 140 141 142 143 144

Nos. 447 448 449 450 451 452 453 454 455 456 457 458 459 460
Cents..... 134 135 136 137 138 139 140 141 142 143 144 145 146

Nos. 461 462 463 464 465 466 467 468 469 470 471 472 473 474
Cents..... 136 137 138 139 140 141 142 143 144 145 146 147 148

Nos. 475 476 477 478 479 480 481 482 483 484 485 486 487 488
Cents..... 138 139 140 141 142 143 144 145 146 147 148 149 150

Nos. 489 490 491 492 493 494 495 496 497 498 499 500 501 502
Cents..... 140 141 142 143 144 145 146 147 148 149 150 151 152

Nos. 503 504 505 506 507 508 509 510 511 512 513 514 515 516
Cents..... 142 143 144 145 146 147 148 149 150 151 152 153 154

Nos. 517 518 519 520 521 522 523 524 525 526 527 528 529 530
Cents..... 144 145 146 147 148 149 150 151 152 153 154 155 156

Nos. 531 532 533 534 535 536 537 538 539 540 541 542 543 544
Cents..... 146 147 148 149 150 151 152 153 154 155 156 157 158

Nos. 545 546 547 548 549 550 551 552 553 554 555 556 557 558
Cents..... 148 149 150 151 152 153 154 155 156 157 158 159 160

Nos. 559 560 561 562 563 564 565 566 567 568 569 570 571 572
Cents..... 150 151 152 153 154 155 156 157 158 159 160 161 162

Natural Gas versus Coal Gas.

A well-known metallurgist writes us: "In order that the value of natural gas could be ascertained for comparison with carbonic oxide and hydrogen made in a gas producer by the use of air-burning coal to these gases, a petroleum vaporizer operated by the use of superheated steam has been connected with the gas-inlet neck of the Henderson furnace, which was recently removed from Bellefonte to Boston, and arranged so as to burn the vaporized petroleum when the coal-gas producer is not in use. The vapor is conveyed through a pipe to the inlet neck of the furnace and mixed with heated air in the same manner as if coal gas were used from the gas producer. Vaporized petroleum, when free from steam or other inert matter and burned with air heated to the same temperature as when used to burn coal gas from the producer, should give a greater quantity of heat for the same weight than that obtained from producer coal gas with about 1.1 per cent. less intensity by calculation. Natural gas, being a mixture of marsh and ethyl gases, for the same weight gives 10.5 per cent. greater quantity of heat and the same intensity as gas made from coal when used under the same conditions. Thus 100 pounds of gas derived from 15.4 gallons of petroleum are the equivalent of 115 pounds of carbonic oxide and hydrogen produced from 120 pounds of bituminous coal, and 100 pounds of natural gas are equal to that produced from 122 pounds of coal."

"The working of the furnace with petroleum and coal approximates nearly enough to the above to confirm it, as 25 gallons of petroleum weighing 162½ pounds are vaporized and used per hour to melt 2-ton charges of soft steel, while but 240 pounds of Westmoreland coal can be used per hour for the same result, as the proportions of the producer will not allow more coal to be made into gas in it. It is then 162½ pounds of petroleum or 240 pounds of coal per hour. A producer of capacity for a 10-ton furnace will convert 1200 pounds of coal per hour, or 28,800 pounds of Pittsburgh slack coal per 24 hours into 802,938 cubic feet of carbonic oxide and hydrogen gases, mixed in the proportion of about three parts by weight of carbonic oxide to one part of hydrogen, at the total cost of \$6.50. In this estimate the coal costs 30 cents per ton with the labor of two men and a ton of furnace slack for flux. This is equal to 0.8 cent per 1000 cubic feet, or, allowing for difference of heating, power equal to less than 1 cent per 1000 cubic feet. Eight thousand cubic feet of the above composition will convert 1 ton of pig and scrap into steel and heat the ingots for rolling into rails or other large sections, being but 6.4 cents per ton for both uses."

The Inventor Hydraulic of Gold Mining.

The process of hydraulic mining, so long conducted in California, originated there. When the miners first went to California they used the pan, rocker, tom, sluice, ground sluice, &c., and with the most primitive appliances took out millions of dollars worth of gold. The gulches, bars, flats, low banks and river beds held the concentrated golden sands and nuggets which had been deposited there during the disintegration carried on by nature. But as these spots became worked out and scarcer it was necessary to adopt more rapid systems than those in vogue to obtain the gold. About this period the system of hydraulic mining came into use. Its first conception has generally been credited to E. A. Matterson. Another claimant for the honor was A. Chabot, who is said to have had a hose at work some months before Matterson. Chabot is generally credited with using a hose to bring the water from the top of the bank to the bottom of his diggings, but he used no pipe or nozzle. Matterson is said to have first used his hose and nozzle in April, 1853, at American Hill. We recently heard that Mr. George R. Warren, of San Francisco, was really the first one who devised the plan of turning a stream against a bank through a hose and nozzle. Mr. Warren feels confident that he really was the first to do this, and, upon being interviewed, told the story to a reporter of the *San Francisco Mining and Scientific Press* in the following words:

"There were four of us, John McCargo, Ben Halsey, Samuel McRaider and myself, mining on Selby Hill, Nevada County, near Nevada City, in the summer of 1852. We were sinking four shafts, and run a tunnel to tap the shafts to drain the claims, and after we got the drain in we found the claims below were owned by other parties. We then got permission to run our drain tunnel under their ground. Finally we bought their ground and the ravine below with the intention of ground sluicing. This was after the parties below worked out their claims. When we could not get plenty of water we drifted our ground and worked on the surface with a small quantity. When we found that the ground below us, having been worked out, began to come down we had to put in some boxes to drain it, for fear it would come down before we got through, but we got our drain in before it did fall. We were buying water from the Rock Ditch Co. at the time. The claims were small in those days—about 30 feet square. We got water nights and Sundays free, because the company had no reservoirs to save the water. In running the water over the ground we found it loosened the bank. I said to the boys, 'Boys, we can put up something here in the way of water pressure and we can knock this dirt all down out of the way.' They were all in favor of the plan. I went over and got some duck or canvas, twine, needles and a palm, as one of our number understood sail-making and could therefore make the canvas part; and we got the tinner, John Kinney, to make the nozzle, which was 3 feet in length, 3 inches at the butt end and 1½ inches at the small end."

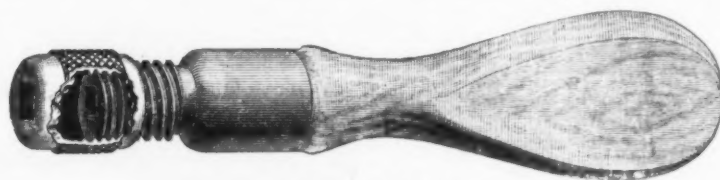
"I sent the things over by the butcher, as I wished to keep our plans dark, and said nothing to the tinner as to what I wished the nozzle for. The next morning we commenced to make the flume for carrying the water to the edge of the bank. We then took a sluice and cut it in two crosswise, and

took the two parts and fastened them together like a box, to connect with the flume. This box was set on end up from the ground. The water came in at the top end from the flume, and we fastened our hose at the bottom end. The lower end of this box stood about 3 feet above the ground, so as to give us room to attach the hose. We had it done on Saturday at noon. The tinner's bill was \$5. He wanted to know what I was going to do with the horn or nozzle, and I told him it was to call the boys to dinner. I stopped to see Hortonby, who was running the water office, and told him we wanted to get water from Saturday night to Monday morning and he let me have it free. We got pine knots, so as to have plenty of light to work by at night and started this 'hydraulic.' People below did not know what so much running water meant, and about 500 miners visited the work before Monday morning. It just took the bank right down. It was not a week before they had one on Oregon Hill. Some put up sluice-boxes and just attached a nail keg; afterward improvements were made. Matterson was working on the other side of the ridge, 1½ miles down; he may have seen our rig that Sunday. We laughed at the idea of Matterson getting a patent on that. The dirt we got before running the 'hydraulic' was pretty rich, and it paid a great deal better after the 'hydraulic' was put in. We got about \$2800 from just the top dirt. Afterward I sold out and went to Dutch Flat in about 1855."

HARDWARE NOVELTIES.

New Tool Holder.

The Syracuse Twist Drill Co., of Syracuse, N. Y., offer a new style of Tool Holder which is represented in the accompanying cut. The square hole in the cap, being larger than that in the shank, is alluded to as allowing any of the ordinary bits to pass through and rest in the shank. Being drawn out more or less, according to the size of the head, and screwed down firmly, so as to

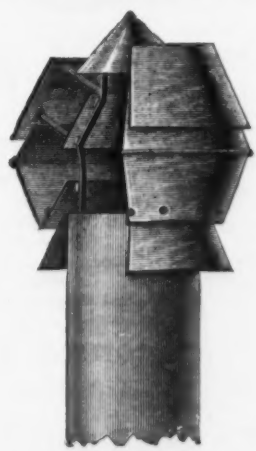


Patent Tool Holder.

engage with the corners of the shoulders, the point is made that it will hold all the ordinary tools with this style of head. Its convenience for use in many places where the bit-stock would be awkward, and also for household and amateur purposes, is also alluded to.

Bradbeer's Chimney-Cowl and Ventilator.

Bruce & Cook, 186, 188 and 190 Water street, New York, are offering to the trade Bradbeer's Chimney-Cowl and Ventilator, which has been recently patented. This cowl does not require to be elevated on a long length of pipe, but is placed immediately upon the roof or chimney, with only a base support. The cowl is claimed to increase largely the capacity of flues, besides preventing all smoke and soot from being blown down the chimney, as its construction will not admit of a down-current of air. It is recommended as a ventilator for public buildings, closets, railway cars, show-windows, &c., and is said to be perfect in action in the lightest air, and entirely waterproof in the heaviest rains. As it can be set very low without interfering with its action,



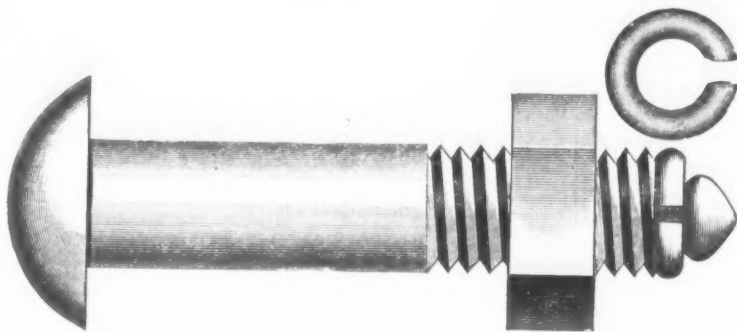
Bradbeer's Chimney-Cowl and Ventilator.

it is well adapted for use on vessels where a short pipe is a necessity. By the manner in which the inclines are shaped it is claimed that a pressure of air on one side will always be relieved on the opposite, thereby creating a suction or pull upon the air at the lower opening. The small sizes of these tops are made of galvanized iron and the large sizes of black iron japanned.

A New Nut-Guard.

The accompanying illustration shows a new device, made under a recent patent, for preventing nuts from coming off axles and wherever it is desirable to have them securely held in proper position. It is the invention of Ewald Over, of Indianapolis, Ind. As will be seen by reference to the cut, a groove is formed near the point of the axle or bolt, and a ring provided, adapted to enter such groove, whereby after a nut is put on the axle or bolt and the ring put in place in the groove the nut will be prevented from coming off until the ring is first removed. It will be seen, referring to the cut, that a view is given of the ring before it is applied, and of the bolt with nut and ring in place. In applying this device the nut is first screwed on to the bolt or axle in the ordinary manner; the ring is then forced over the point or conical end into the groove, into which it is drawn and where it is held by its inherent spring. It is mentioned that

the ring is generally forced into position with the aid of a concave pointed set adapted to fit over the conical point of the bolt. It is stated that by placing the ring close up to the nut when screwed in place it will answer both as a nut lock and guard. The manufacturer also points out that by regulating the depth of the groove the opening can



Over's Patent Nut-Guard.

be so made that the nut, if unscrewed with a wrench, will force the nut-guard off, or that, if desired, the groove can be so formed that this cannot be done.

Liability of Owner.

A correspondent writes: "I take the liberty of submitting a question for reply with reference to the liability of owner. I have had several such cases in my experience, and it is probable that many of the readers of *The Iron Age* have encountered similar cases. Accordingly, the answer will prove valuable. A man whom we will call Smith comes to the place of business of Jones and requests Jones to send a man to repair the roof and leaders of his house. Jones, supposing and believing that Smith is the owner of the house, sends the men, furnishing the mate-

rial, does the work, and in due course of time presents his bill. This Smith neglects and refuses to pay, whereupon Jones sues Smith for the amount, obtains judgment and issues an execution, which is returned unsatisfied on account of the fact of Smith's wife being the owner of the property instead of Smith. Now, the question is, Can the wife, whose property receives the benefit, be held liable after judgment has been obtained against the husband?"

To this we reply that under the common law the property of a wife was formerly liable for her husband's debts. But in New York, if not in all the States, the law has been changed so as to give a married woman absolute ownership of her property, free from any claim of her husband or his creditors. It is not on this ground, therefore, that Mrs. Smith can be held, if at all, for the debt of the unfortunate Jones. The only principle on which her liability can be established is the agency of her husband, because, so far as the facts show, she had nothing to do with the matter—not even any knowledge of it. Did Smith in his dealings with Jones act as agent for his wife, and did he have the authority, express or implied, to make the contract and bind his wife by his act? If so, she is responsible; if otherwise, she is not. The fact of the existence of such agency cannot be inferred from the mere relation of husband and wife. A husband has no right to meddle in his wife's business affairs without her sanction, and no prudent business man is justified in dealing with him in such affairs without satisfying himself of his authority. If Smith has, in the case stated by our correspondent, acted without consulting his wife and without her knowledge or consent, the fact that her property has received a benefit will not be enough to charge her with the payment of the bills. A man cannot improve another man's property without his request and then make him pay for it. Under such circumstances the only thing for Jones to do is to hold on to his judgment against Smith and derive such comfort as is possible from the hope that the latter's financial condition will improve sufficiently to make the issue of the second execution at some future time a more satisfactory proceeding than the first.

But the fact of Smith's really being his wife's agent may be inferentially proved by slight circumstances. The husband may have been in the habit of acting for the wife in the protection of her property interests as a sort of real-estate agent, for example. The acquiescence of the wife in her husband's arrangement and contract may confer upon him after a time the implied right to bind her in other matters of a similar kind. He obtains by usage the implied right to represent her, and the public is then justified in relying upon this apparent authority. If this is the case it is not necessary that any particular matter should be brought to the wife's notice, or that she have any information on the subject. She is equally liable in either event, as the husband has the powers of a general agent. Even if the husband had no authority to act for his wife, she must repudiate his contract as soon as she is informed of it if she desires to escape liability. Should she reside in the house, for instance, and should see the men at work and allow them to go on without inquiry or protest, she would be deemed to have ratified her husband's orders, and, accepting the benefit, could not repudiate the burden. These remarks are based on the hypothesis of facts not fully stated in our correspondent's question, but which, it is evident, very materially modify the conclusions to be arrived at. The fact that Jones supposed and believed Smith to be the owner of the house and was unaware that he was merely acting as agent would make

held liable at all is that he did not disclose the fact that he was acting as agent or the name of his principal. If he has stated the truth to Jones in making the contract for repairs, he could not then be held at all. But Jones, not knowing the truth, and under a wrong impression as to the facts, was justified in suing Smith. To say that when he discovered his error he cannot sue the principal is absurd. The judgment against Smith would be no bar to a recovery against Smith's wife, the owner of the property. Of course nothing can be collected of the wife on the execution against her husband. There must be another suit. If Jones acts in time, he may obtain a mechanic's lien on the property. But, as we have said, the important thing is to prove agency. Without this the wife cannot be held liable simply because she is the owner.

Telephone Charges.

The Chicago *Tribune* has printed the results of inquiries made by its representatives in the 33 largest cities in the United States in point of population relative to the management and tariff of local telephone exchanges. The gist of the information thus acquired is to be found in the following table, which appears as printed, except the population in 1880 of the cities named, which is omitted:

Places.	Tariff per year.	Number of instruments.
New York.....	\$50 to \$125	9,000
Brooklyn.....	100 to 150	3,000
Jersey City.....	72 to 145	3,500
Philadelphia.....	100 to 130	2,100
Chicago.....	48 to 80	1,429
Boston.....	50 to 150	1,659
St. Louis.....	60 to 151	2,700
Baltimore.....	60 to 166	2,017
Cincinnati.....	84 to 600	1,730
San Francisco.....	50 to 110	1,730
New Orleans.....	48 to 100	1,330
Cleveland.....	40 to 62	1,400
Pittsburgh.....	42 to 60	2,025
Albany.....	42 to 60	1,470
Buffalo.....	48 to 60	2,250
Washington.....	48 to 60	1,176
Louisville.....	30 to 60	825
Detroit.....	48 to 180	1,796
Milwaukee.....	36 to 130	1,000
Providence.....	30 to 75	1,100
Indianapolis.....	40 to 75	725
Richmond.....	48 to 72	1,300
New Haven.....	48 to 60	605
Worcester.....	45 to 60	830
Kansas City.....	40 to 75	800
Syracuse.....		
Columbus.....		
Hartford.....		

* 500 to 2,000 messages.

This table, it is explained, will have to be read with a great deal of allowance, because there are many local circumstances which affect the value of the service, and in some cases the figures are not absolutely accurate, but they are as nearly so as can be obtained. There is a great variety in the rules of the various exchanges and the scale of charges. There is also a great difference in the distances traversed by the wires in different cities of the country, and the managements of the companies have evidently tried to graduate their charges accordingly, but everywhere they have charged as much as the public would pay. For Chicago the minimum tariff is for residences and the maximum for public telephones. The charge to business houses is \$125 a year. In Milwaukee the charge for a public telephone is the same as for a business house. The highest St. Paul and Minneapolis rates are paid by persons living 3 or 4 miles out of town. In Indianapolis the tariffs are to the last degree irregular. The regular annual tariff in Detroit is based on the length of the wires in use. The business rate is \$72 per year for the first ¼ mile, and \$30 extra per mile beyond the first ¼ mile; professional rate, \$60 per year; residence rates, \$50 for the first ¼ mile, and \$20 for every additional mile. The extreme rate of \$166 at Cleveland is for an instrument on the outskirts of the city. There is a small increase in the rate for each ¼ mile of distance. At Albany the limit of minimum charges is ¼ mile, and at Syracuse ½ mile.

In New York, Brooklyn and Jersey City there are 9000 instruments, and within a radius of 25 miles 12,500. In Washington there are regular rates for fractions of years, which are proportionately higher than for a full year. The wide differences in the tariffs at Pittsburgh are due to the peculiar topography of that city. Providence has a very large number of telephones for its population, which in 1880 was about 104,000. There are 2250 telephones in the city, and 3100 connected with the exchange, including those of outlying towns.

The Pan Electric Co. are trying to introduce themselves in St. Louis, and are also operating on a small scale in New Orleans. San Francisco seems to get its service about as cheaply as any city, considering the number of persons reached by the wires. There are 2017 instrument in the city and 1070 in connecting exchanges in the State. The regular tariff in Worcester, Mass., is that recently established by the New England Telephone Co. for all cities in New England

of over 20,000 inhabitants except Boston. Heretofore the rates have been very irregular.

The Deterioration of the British Workman.

In one of his weekly letters to the London *Colliery Guardian*, Mr. G. J. André says: "There is another cause operating to place the English manufacturer at a disadvantage with respect to his Continental rivals, which no amount of technical instruction can compensate. It is humiliating to have to confess it, but I fear the charge so often brought against us by foreigners is too obviously true to admit of denial. The moral character of the British workman has deteriorated. The superior energy which distinguished him in former days is not so readily discernible as it used to be, nor is the self-reliance on which he was justly wont to pride himself still one of his most prominent characteristics. Whatever else union influence may have done for him, it has not made him either more industrious or more independent and manly. The drunk question is probably at the root of it all. What the influence of a superior general education may be in checking the further progress of this evil, we must wait another generation to learn; but from the standpoint of the present time the outlook in this direction is not cheering. These plain statements of fact will probably raise a howl in certain quarters, but the sad truth will remain, nevertheless. In support of what I have here set forth, I will relate my most recent experience. Let it not be understood that I have formed my opinion upon this single instance. I could multiply them without number, but this will be sufficient to illustrate my meaning:

"A few weeks ago I had need of some metal castings, and to save time and trouble in transport I gave a portion of the order to a well-known firm of foundries in London, another portion to a small French firm, and a third to a large German company. The Continental foundries executed the order promptly. The London foundries have not yet completed the work. And why? First, the August 'bank holiday' gave the men an opportunity to 'get on the drink.' This circumstance completely disorganized the shop for about three weeks. Then, as these men could only get off the drink gradually, every Monday, thanks to a perverted use of the Sunday holiday, was spent in drunken idleness. Next came the great fire at Clerkenwell. The men naturally turned out to see it. Here was an opportunity for more drink, and the experience of the bank holiday has been repeated. Now I am ready to admit that this is an exceptionally bad case. But, in a less aggravated form, the same thing is of common occurrence. Of course the costs of production are notably increased by behavior of this sort on the part of the men, and the employers are compelled to tender a higher price than they would otherwise do. In this case the London prices were 11 per cent. above the French and 17 per cent. above the German. The Continental workman, whatever else he may not be, is industrious and sober, and these qualities enable his employer to rely upon him absolutely."

The Blue-Print Process.

In the proceedings of the Engineers' Club of Philadelphia Mr. R. M. Jones gives the following instructions for using the blue-print process:

1. Cover a flat board, the size of the drawing to be copied, with two or three thicknesses of common blank or its equivalent.
2. Upon this place the prepared paper, sensitive side uppermost.
3. Press the tracing firmly and smoothly upon this paper by means of a plate of clear glass laid over both and clamped to the board.
4. Expose the whole—in a clear sunlight—from 4 to 6 minutes. In a winter's sun, from 6 to 10 minutes. In a clear sky, from 20 to 30 minutes.
5. Remove the prepared paper and pour clear water on it for 1 or 2 minutes, saturating it thoroughly, and hang up to dry.

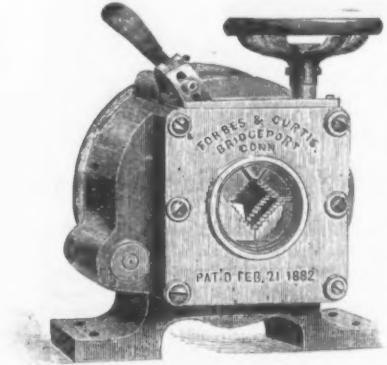
The sensitive paper may be readily prepared, the only requisite quality in the paper itself being its ability to stand washing. Cover the surface evenly with the following solution, using such a brush as is generally employed for the letter-press: 1 part soluble citrate of iron (or citrate of iron and ammonia), 1 part red prussiate of potash, and dissolve in 10 parts of water. The solution must be kept carefully protected from light, and better results are obtained by not mixing the ingredients until immediately required. After being coated with the solution the paper must be laid away to dry in a dark place, and must be shielded entirely from light until used. When dry the paper is of a yellow and bronze color. After exposure the surface becomes darker, with the lines of the tracing still darker. Upon washing, the characteristic blue tint appears, with the lines of the tracing in vivid contrast. Excellent results have been obtained from glass negatives by this process.

The Mexican Government shows much vigor in establishing steamship communication with various remote points. According to advices received by Señor Romero, the Mexican minister at Washington, steamers are to be either built or chartered to run direct from Mazatlan and other ports on the Pacific to China. They are to sail under the Chinese flag and are to receive a subsidy from both the Mexican and Chinese Governments. Last year a line of steamers was established between Vera Cruz and Liverpool, touching at Havana and St. Thomas, and making bi-monthly voyages, for which they receive a subsidy of \$18,000 for every round trip. The steamers are owned by British capital, and during the present cotton season are calling at New Orleans for Liverpool cargoes. Mexico also offers a subsidy of \$18,000 for each round trip for the first five years, \$15,000 for the second five years and \$12,000 for each round trip during the third five years to any company that will establish a monthly line of steamers between Vera Cruz, Venezuela, Brazil and the ports of the River Platte. It is understood that an English company will accept this contract and start the steamships very soon

MECHANICAL.

New Die-Stock.

The Die-Stock shown in the accompanying engravings is a new form of tool recently put upon the market by Forbes & Curtis, of Bridgeport, Conn. While retaining the advantages of their old-style tool, the new article has a self-centering vice of entirely new design and made to resist the severe strains incident to making up fittings. The tool is complete as supplied by the manufacturers, and only needs to be set up on the bench. The capacity of the tool is from



New Die-Stock.—Fig. 1.—Front View of New Form of Die-Stock Brought Out by Forbes & Curtis, Bridgeport, Conn.

1/4-inch to 2-inch pipe, and bits and dies are supplied for both these sizes for both right and left hand threads. The manufacturers assure us that a boy with this tool will effect such a saving in the cost of work over ordinary methods as to pay for it in a short time. It is asserted that a boy can do the work of two men, and that he can cut 2 inch pipe all day, turning out a surprising amount of work. Numerous small improvements in construction have been introduced in various parts. Our engravings show the tool from opposite sides.

Boiler Inspection.

With the view of disabbling the old and mistaken notion that State inspection of steam boilers would be an efficient means of preventing explosions, we cannot do better than reproduce the following item, with comments, from a recent issue of the *Locomotive*:

"There were two terrible boiler explosions yesterday, one at — and the other at —, seven persons being killed or fatally injured by the two accidents. One explosion was found to have been caused by mud in the boiler. No boiler is exploded except by carelessness or neglect to cast off an old and worn-out boiler. Every State should have severe laws requiring careful inspection of boilers once, if not twice, a year. The inspection should be by the State."

The above, which appeared in a daily paper of recent date, exhibits the popular idea of the way by which boiler explosions may be surely prevented. While the idea in itself is all right, and while it is undoubtedly true that many explosions would be prevented if such a law were in force in every State in the Union, as it is in some, with good effects, still we must be allowed to take exception to the extreme measures that seem to be implied by the italics in the last paragraph. If we are not mistaken, that means that, in the editor's opinion, State inspection would prevent all accidents of this sort. From this latter opinion we respectfully, but most emphatically, dissent.

It will be found that there are certain practical difficulties which interfere with the efficient operation of such laws in many cases. All State or national officials of this class are quite apt to be appointed, not for their special fitness for the duties they are to perform, but for political reasons. Now, boiler inspection is a peculiar business, and men engaged in it should be selected for such work on account of their ability and trustworthiness. Being found competent and honest, he should not only be left undisturbed to perform his duties, but he should have some guarantee that such should be the case so long as he performed his duties properly. We think that any fair-minded person will admit that, under any political régime which is liable to change, this would not be the case. If the inspector feels that he is liable at any time to be removed for no good reason, and some one put in his place

that it is, and it will probably continue to be so as long as human nature possesses the characteristics that it does at present. Another thing that militates against the perfect operation of any law is this: When an official inspector has made an examination of a boiler and issued a certificate, that ends the matter, so far as he is concerned. If it explodes he loses nothing and is not held responsible. If his position or his salary were to be forfeited, the character of the inspection might be different in many cases. But we do not wish it to be inferred from the foregoing that we are not in accord with the spirit of such laws. That is a thing to which no possible exception could be taken; we only wish to call attention to certain practical difficulties which would arise in many localities against the proper working of it. Of course there would be many exceptions, as there are differences in many communities, and in many cities that have similar laws in effect their working is all that can be desired, while at the same time in other places they are of no use whatever, and for the very reasons which we have mentioned.

Utilizing the Mechanical Energy of Natural Gas.

Ever since the tapping of the first natural gas well in the Pittsburgh districts the question of how to profitably utilize the energies stored up in this fuel has been kept prominently in view. Not the least important of these was the mechanical energy—the gas issuing from some of the wells at comparatively high pressures, ranging from about 65 to 70 pounds per square inch. In some places the gas was accordingly used to drive engines, the pressure only being utilized and the heating power wasted. Where, however, the gas was carried through pipes for long distances, branch pipes running out at numerous points, the pressure was found to be so greatly reduced as to make this impossible, and as the gas, moreover, carried along sand and other mechanical impurities, its direct utilization in engine cylinders proved of questionable value and often resulted in the necessity for extensive repairs. Practically, therefore, this plan was of little value and but few benefits were realized from it. Notwithstanding this fact, however, it again came to the surface a short time ago and was spoken of in several papers as entirely novel and well calculated to secure exceptional advantages in point of economy and convenience. Obviously this is all wrong, and careful examination of the history of natural gas and its applications would have shown that the

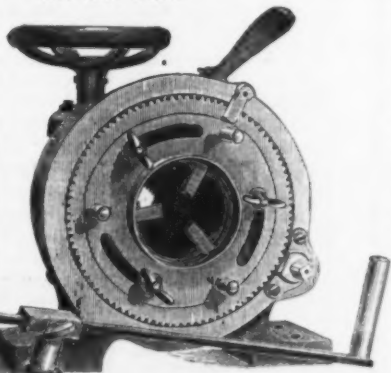


Fig. 2.—View of Rear Side.

method never advanced much beyond the experimental stage.

The Morse Automatic Inspirator.

In the annexed engravings we present perspective and sectional views of an exceedingly simple and convenient boiler-feeding device made by the Morse Automatic Inspirator Co., of 132 Bank street Cleveland, Ohio. It is the invention of Mr. John Desmond, of that city, and embraces readily apparent features of interest.

A general view explaining the method of attachment is shown in Fig. 1. From Fig. 2, which represents a longitudinal section, the action of the device will be easily understood. An exterior steam-duct establishes

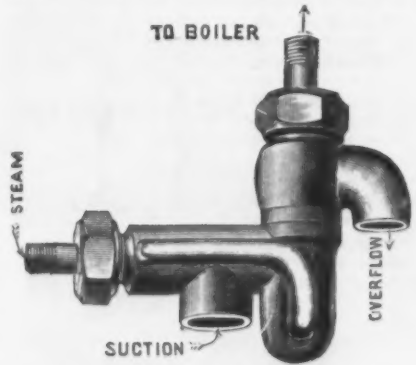


Fig. 1.—Perspective View.

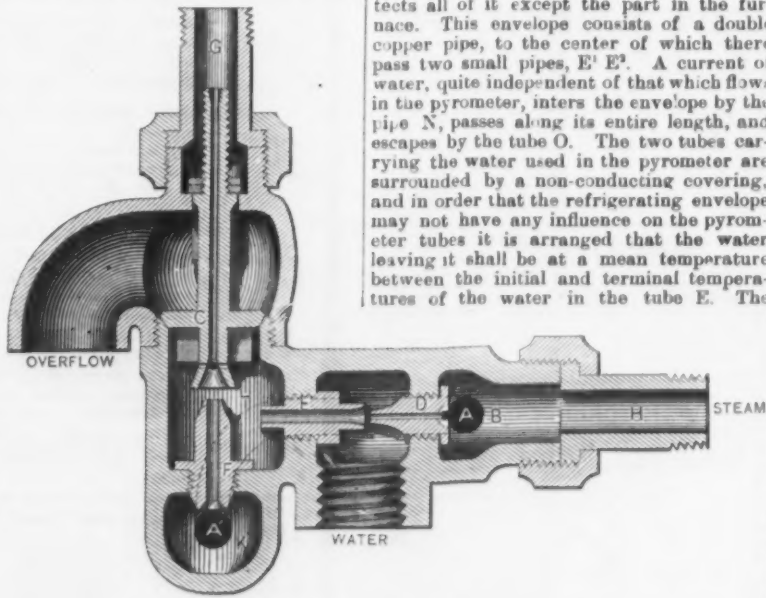


Fig. 2.—Longitudinal Section.

THE MORSE AUTOMATIC INSPIRATOR.

who is more than likely to be incompetent, he will naturally fail to give his work the conscientious attention that it requires, and if he be of the average character of political appointees he will be quite as likely to give more attention to the matter of perquisites than to boiler inspection. It is much more agreeable work.

Politically useful men of any party are not usually the kind of men a private individual would select to make boiler inspections if he had a direct pecuniary interest in the result depending thereon. This, of course, should not be so, but the fact remains

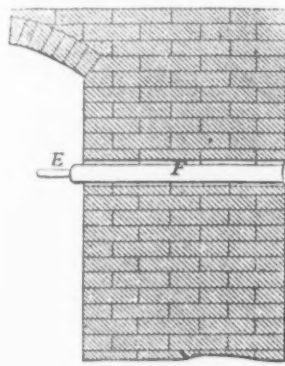
communication between the chambers B and K, the openings into these chambers being shown at A and A' respectively. Steam enters the chamber B through the supply pipe H; a portion of it thence passes through the nozzle D and the tube E, carrying along the water, into the chamber L. The other portion of the steam enters the outside duct at A and reaches the chamber K through A'. From there it passes through the tube F, is condensed, and with the water from the chamber L passes through C and the feed-pipe G into the boiler. The channel C is formed in the valve-rod of a valve which

cuts off communication with the overflow; the lower part of this valve-rod, moreover, is furnished with transverse orifices, through which the water finds admission to the passage C. The other end of the valve-rod is fluted longitudinally, the fluting terminating in a disk shoulder which forms a bearing for an elastic washer.

A globe-valve is placed between the inspirator and boiler, an upright check-valve between the inspirator and water supply, and a common check-valve between it and the boiler. The action is entirely automatic. The inspirator is made in 12 sizes, and its simplicity is well calculated to secure its favorable reception.

The Saintignon Pyrometer.

In the Pyrometer invented by M. de Saintignon high temperatures are measured by inserting in the furnace a tube through which a current of water is passing at a uniform rate. The temperature of the water is measured by a mercurial thermometer as it enters the tube, and again as it leaves, and from the difference of the two readings the intensity to which it has been exposed is deduced. The instrument is made in two forms. In the first it is applicable to heated spaces with thin walls, such as smoke-boxes, and in the second to furnaces inclosed with masonry. It is the latter form of which we annex an illustration. It comprises two thermometers, T¹ T², graduated with long scales and connected by elastic



THE SAINTIGNON PYROMETER.

tubes to the pipe E, which is passed through the wall into the furnace the temperature of which it is desired to measure. A uniform current of water flows from a reservoir situated at a height of about 10 feet above the pyrometer, passes through a filter and descends into a vessel encircling the bulb of the thermometer T¹. This thermometer indicates the initial temperature of the water. From it the water flows by the elastic tube E' into the copper tube E, which is situated within the furnace and is exposed to its heat at the particular point where it is stationed for the time being. The water becomes heated in its passage and returns to the second thermometer T², where its temperature is again measured. The speed of the current and the length of the tube exposed to the action of the fire are so adjusted that the water is raised 1° for each 25° of the furnace. A plate, P, furnished with a handle, p, carries a scale advancing 25° for each degree of the thermometer scale; its zero point is placed opposite the head of the column of mercury in the thermometer T¹, and the temperature is read opposite the top of the mercury in T². After leaving the second thermometer the water enters the pressure-gauge M, which consists of a tube open at its upper extremity and carrying at its lower end a cock, R, by which the water escapes. By adjusting the cock S the flow is regulated until the water rises to the mark B in the tube, and so long as it does not vary from this point it is known that the calculated discharge is taking place through the cock R.

It is necessary, for correct determinations, that the water should not gather heat until it actually enters the furnace, and to this end the tube E is covered with a refrigerating envelope, F, which incloses and protects all of it except the part in the furnace. This envelope consists of a double copper pipe, to the center of which there pass two small pipes, E' E². A current of water, quite independent of that which flows in the pyrometer, enters the envelope by the pipe N, passes along its entire length, and escapes by the tube O. The two tubes carrying the water used in the pyrometer are surrounded by a non-conducting covering, and in order that the refrigerating envelope may not have any influence on the pyrometer tubes it is arranged that the water leaving it shall be at a mean temperature between the initial and terminal temperatures of the water in the tube E. The

oughly understood, and it would be to the advantage of power users if a series of exhaustive experiments were made in order to obtain some thoroughly reliable data." Belting, it is true, is not thoroughly understood by all, nor as well as it ought to be, but, at the same time, it has not lacked that careful attention which our contemporary evidently had in mind. Both analysis and experiment have been brought to bear on the subject, and many valuable experimental data have been compiled. As a matter of fact, however, experiments on the amount of power that can be transmitted by a belt of given size show many discrepancies, and to this circumstance are due many of the difficulties encountered in connection with the subject. These discrepancies, it seems, arise from the fact that belts of different qualities are often experimented upon, and

does not pass the valves. In starting the engine, therefore, the by-pass is opened and permits the operation of the pump with but little effort, while as soon as the engine is running the valve is closed and the pump thrown into effective action.

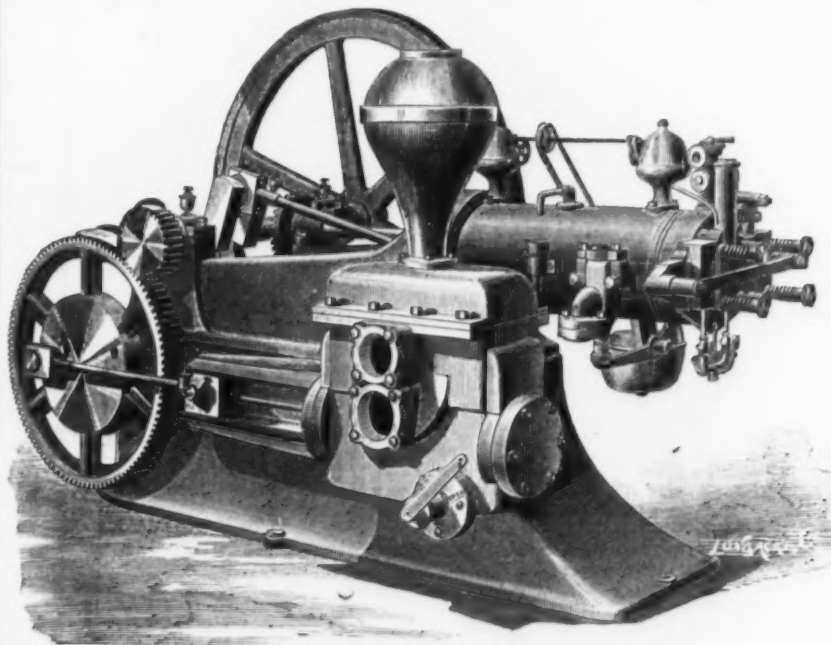
To stop or renew the flow of water while the engine continues running, the same valve is opened or closed, and instead of the lever being worked by hand it is acted on by a float in one of the elevated tanks. The engine is thus either fully loaded or entirely relieved of all work, and no power is wasted during the intervals that no water is delivered to upper tanks. The gas consumed corresponds, then, to the friction in engine and slow motion of pump-piston, being only about one-fifth of the possible total consumption of a given size. Besides the saving secured by this by-pass in running expenses, it reduces the first cost of the machinery by dispensing with the piping, valves and cocks necessary to return water to the lower tank, and with the friction-clutch formerly used between the engine and pump, and at the same time it simplifies the entire pumping plant. It combines two separate elements formerly used in this kind of machinery in one, which is more simple than any one of the two it replaces simultaneously, viz., the friction-clutch, and the valve and piping discharging into the lower tank. The pumps connected with the Otto engines are large, with slow movement, to avoid hammering and to secure the greatest possible useful effect.

Iron Chimneys in England.

Iron chimneys do not seem to have met with much favor in England, and, accordingly, very few are to be seen except in places where small boilers are used, or where brick, stone or concrete are difficult to obtain. Even in such cases, we find it stated, old boiler flues are occasionally used, one, two or three being bolted together, secured to a stone base and held by guys from the top. These, naturally, are unsightly in appearance, and if, as examples of iron chimneys generally, they give birth to prejudice against them, it should not occasion surprise. Often they are only of a temporary nature and little care is consequently given to their construction and maintenance. Iron chimneys, properly constructed and worthy representatives of their class, are apparently exceptional and in use at only a few English iron works. Rapid deterioration due to peculiarities of the English climate may be responsible for this circumstance and explain why the advantages of the iron chimney are not more generally realized there.

The Wery Chimney.

In the chimney devised by Mr. Wery for the prevention of smoke and economy of fuel, the special feature, according to the *Bulletin de la Société d'Encouragement*, consists simply in mixing with the burnt gases from the furnace a certain quantity of air relatively cold. The air penetrates the hot current in the manner of the Giffard injector, entering the chimney through a narrow circular opening all round the chimney near its base, proportioned in area to the section of the chimney. The current of



COMBINED OTTO GAS ENGINE AND PUMP, BUILT BY SCHLEICHER, SCHUMM & CO., PHILADELPHIA.

Combined Gas Engine and Pump with by-pass valve, specially adapted for use in connection with hydraulic elevators. A combination of this kind has long been desired, and the arrangement at which we illustrate will accordingly prove generally acceptable. When working an hydraulic elevator the gas engine cannot be started with the load on, and a friction-clutch was therefore used between the engine and pump to disconnect the latter for the purpose of starting. An automatic means to stop delivery of water when upper elevator tank was filled had also to be devised, and this was generally accomplished by the opening of a valve at the lower end of the delivery-pipe, through which the water was returned into the same tank whence it was taken. The engine was thus relieved of pumping to any considerable height, though some power was spent in returning the water at a few feet of elevation.

The by-pass valve adapted to the engine by Messrs. Schleicher, Schumm & Co. secures marked advantages both in starting the engine and dispensing with the friction-clutch, and in respect to the automatic regulation of water supply during continuance of motion of engine. It consists of a separate passage below the pump-barrel, which communicates with the opposite ends of the barrel, and of a transverse valve or cock, by which this passage may be opened or closed. When this valve is turned so as to obstruct the passage, the pump works as usual; but when the valve is turned so as to open the passage, the water flows directly from one end of the pump-barrel to the other, and

cold air envelopes the current of hot gases, mixes with it, lowers the temperature and reduces the draft. Without endeavoring to analyze the phenomenon, the results of comparative trials made in December, 1884, with a 12 horse power portable engine, proved that smoke prevention was effected and the fuel economized by the Wery chimney. The preliminary experiments—one made with the new chimney and the other with the ordinary chimney—gave results very favorable to the new chimney. The engine and boiler, worked by a friction brake, were proved to be in good order; the steam was exhausted direct into the atmosphere, the natural draft in the chimney alone being in action. The experiments were repeated a fortnight later, burning coal in moderate-sized pieces, with the following results:

	With the Wery chimney.	With the ordinary chimney.
Duration of trial.....	4 h. 17 m.	4 h. 16 m.
Coal consumed.....	237.4 lbs.	335.8 lbs.
Water evaporated.....	2,351 lbs.	2,371 lbs.
Water per pound of coal.....	9.95 lbs.	7.43 lbs.
Horse-power at the brake.....	11.86 H.-P.	11.86 H.-P.
Temperature at the base of the chimney.....	458° F.	515° F.

Smoke was completely prevented. The time lighting and getting up steam was less with the Wery chimney. The economy effected was 23 per cent. of fuel. These results are corroborations of like results of trials made by Messrs. McKerski and Banderlani on two Thomas and Laurens boilers, and at Fives Lille.

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DESCRIPTIONS AND PRICES.

Card No.	Size and Price Per Card.
1	5 1/2 x 18 in. 40c.
2	3 x 13 1/2 in. 30c.
3	3 x 13 1/2 in. 30c.
4	6 x 16 in. 40c.
5	3 x 13 1/2 in. 30c.
6	3 x 13 1/2 in. 30c.
7	3 x 13 1/2 in. 30c.
8	3 x 13 1/2 in. 30c.
9	3 x 13 1/2 in. 30c.
10	3 x 13 1/2 in. 30c.
11	3 x 13 1/2 in. 30c.
12	3 x 13 1/2 in. 30c.
13	3 x 13 1/2 in. 30c.
14	3 x 13 1/2 in. 30c.
15	7 x 15 in. 50c.
16	3 x 13 1/2 in. 30c.

SAWS.

DISSTON'S NO. 3.	PANEL, HAND & RIP.	W. M. & C. NO. 12.
Length In.	List.	Cost.
16		
18		
20		
22		
26		
28		

DISSTON'S NO. 7.	PANEL, HAND & RIP.	W. M. & C. NO. 25.
Length In.	List.	Cost.
16		
18		
20		
22		
26		
28		
30		

DISSTON'S NO. 8.	HAND AND RIP.	W. M. & C. NO. 26.
Length In.	List.	Cost.
26		
28		

DISSTON'S NO. 8.	HAND AND RIP.	W. M. & C. NO. 27.
Length In.	List.	Cost.
26		
28		
30		

DISSTON'S NO. 12.	HAND AND RIP.	W. M. & C. NO. 28.
Length In.	List.	Cost.
26		
28		

OUR BRAND.

Length In.	List.	Cost.	Job.	Sell.
16				
18				
20				
22				
26				
28				

SPECIAL C. S. PANEL AND HAND.

Length In.	List.	Cost.	Job.	Sell.
16				
18				
20				
26				

COMBINATION HAND.

Length In.	List.	Cost.	Job.	Sell.
26				

DISSTON'S NO. 1.	BACK.	W. M. & C. NO. 5.
Length In.	List.	Cost.
10		
12		
14		
16		

for noting in pencil—List, Cost, Jobbing and Selling Prices—as in sample of Card 11-A, shown in the center of this page. Cards A and B of each number are mounted on each side of a tough, heavy card-board, especially adapted for this use, which is further protected on the four edges by being *cloth bound*. Two-thirds of them are 3 x 13 1/2 inches. This size has been found convenient for hanging on a pilaster finish, or any other narrow surface, without hiding the goods. To hang or chain up each card there is firmly inserted through the top and center a nickel-plated eyelet about 3/8 inch inside diameter. They will be sent, *charges prepaid*, on receipt of price.

DESCRIPTIONS AND PRICES.

Card No.	Size and Price Per Card.
17	6 x 18 1/2 in. 40c.
18	3 x 13 1/2 in. 30c.
19	3 x 13 1/2 in. 30c.
20	3 x 13 1/2 in. 30c.
21	3 x 13 1/2 in. 30c.
22	3 x 13 1/2 in. 30c.
23	3 x 13 1/2 in. 30c.
24	3 x 13 1/2 in. 30c.
25	7 x 22 in. 70c.
26	7 x 22 in. 70c.
27	7 x 22 in. 70c.
28	7 x 22 in. 70c.
29	6 1/2 x 22 1/2 in. 70c.
30	7 x 24 in. 70c.
31	6 x 22 in. 70c.
32	4 x 14 in. 20c.

LESS THAN A SET PRICED AT THE ABOVE RATES.

PRICES IN SETS.

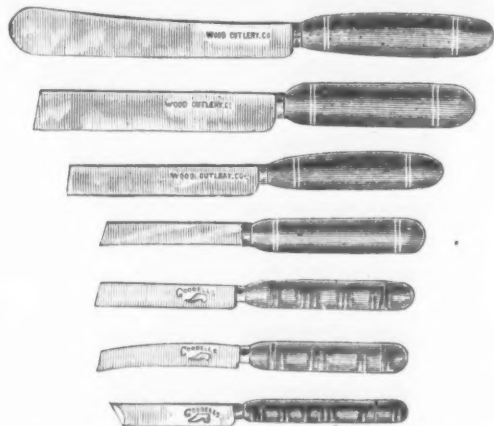
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Set No. 2. Omits Cards Nos. 25, 26, 27, and includes all the other numbers described above. Price, \$8.00.

Set No. 3. For Dealers in Tinware and House Furnishing Goods, consists of Cards Nos. 25, 26, 27. Price, \$2.00 per set.
Set No. 4. Includes the following *Eighteen* Leading Cards for Retail Trade: Nos. 2, 3, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20, 22, 23, 24, 28, 31, 32. Price, \$5.00.

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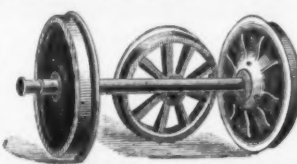
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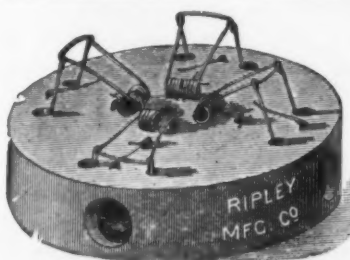
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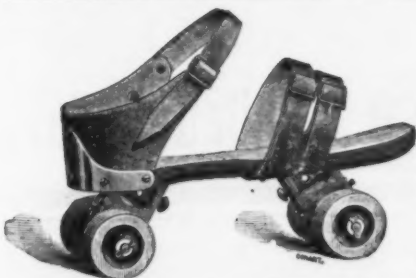


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Charcoal Iron
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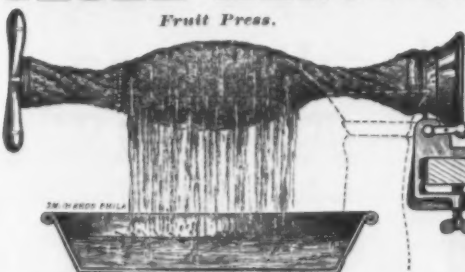
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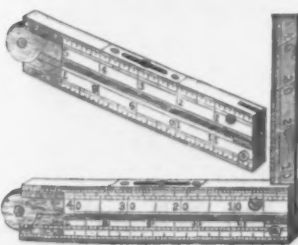
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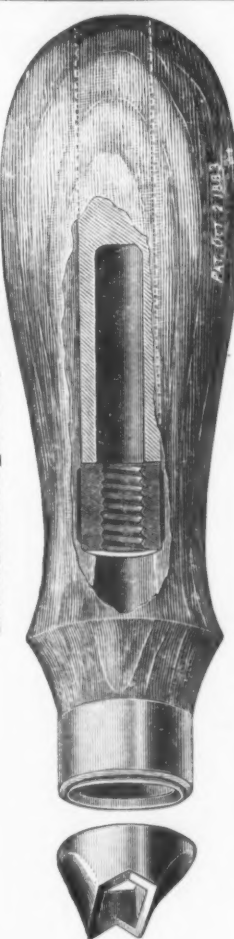
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Steel Versus Iron Ships.

In an inaugural address delivered by Mr. W. Boyd, as president of the North-East Coast of Cleveland Engineers and Shipbuilders, that gentleman said:

When we come to the employment of mild steel for shipbuilding, then there would seem to be some difference of opinion. Mr. Head says, in reference to steel ships, that although the advantages of steel in cases of "slight collisions, grounding in moderate weather, &c.," are undoubted, "there have been cases of steel ships returning from voyages more or less strained, and out of shape in a way rarely experienced previously;" and, further, that the severity of the tests applied to steel materials by Lloyd's Registry is "suggestive that Lloyd's committee have for long been themselves apprehensive that 20 per cent. is far too great a reduction to allow." These two latter statements seemed to me to be so much at variance with my own experience, and so different from the general belief, that I have taken some trouble to inquire into the soundness of the views thus expressed. It so happens that within the last few months I have had direct experience on the question of the behavior of iron and steel in cases of grounding. My company have just had under repairs two steamers which had been ashore—one a steel ship of 1351 tons gross register, the other an iron ship of 2190 tons gross register. I do not propose to trouble you with a detailed description of each accident; but in the case of the steel ship the bottom of the vessel was severely indented for a distance of upward of 30 feet. The point which first came in contact with the rocks was situated on the port side, about 5 or 6 feet outward from the keel and about 20 or 25 feet from the stem, and the indentations continued for a length of about 30 feet abaft of this point. These indentations existed between each frame about 2½ inches to 3 inches deep in the worst places, gradually diminishing toward the after end of the ship. About one dozen of the frames were cracked and broken through the rivet-holes, and a very large number of the small intercostal plates were curled up exactly as if they had been flanged in a smith's fire. Notwithstanding this severe punishment 13 shell plates out of 15 were heated in the furnace, straightened and replaced. The remaining two plates, however, were so severely crushed by the heel of the frame to which they were attached as to be condemned; but they showed no signs of fracture, and all the small intercostal plates were straightened and replaced. To such an extent was this restoration carried on that 78 per cent. of the material damaged by the accident was repaired and restored to its original place in the vessel.

In the case of the iron ship the damage caused by the accident was much more severe. The injury lay more in the center of the ship, and extended from about 20 feet abaft of the stem for a distance of some 170 feet toward the stern. The bar keel was forced up or hogged some 3 inches or 4 inches, which was transmitted through the center keelsons and hold stanchions to the 'tween and upper decks, even resulting in the fracture of the hatch combings. About 84 shell plates were damaged, with corresponding injury to floors, frames and reverse bars, as well as the fore-and-aft girders in the water-ballast tank. According to the best estimate I can make, only about 33 to 35 per cent. of the damaged material could be worked in again. I do not wish it to be understood that in this case of the iron ship the damage could under any circumstances have been limited to the extent to which the steel ship suffered, for I must admit that in the iron ship the seat of the injury lay in that part of the vessel where it was most readily communicated to the rest of the structure; but notwithstanding this admission, I do believe that if she had been built of steel the injury would have been less extensive and more localized. The difference seems to me to lie in this, that the more pliable material lends itself more easily to local injury, and that the damage is thus confined within narrower limits, whereas, in the case of the more brittle material of iron, the local injury is more thoroughly transmitted into the general structure of the vessel, and in this way becomes more extensive. In addition to this the softer material can be straightened and replaced in a manner not possible to the same extent with iron plates and angles.

With regard to the "straining" of steel ships, and the "reduction of 20 per cent." in the scantlings, no direct evidence has come under my personal notice; but the first authority in the country, Mr. Martell, the chief surveyor for Lloyd's Registry, speaking at Glasgow, says that, his attention having been called to the matter, he has made himself, and has caused to be made from Lloyd's surveyors at the outposts, "exhaustive inquiries," and that in no case could he find it clearly proved that a steel ship "had failed for want of general constructional strength," even after "having done heavy work, carrying dead-weight cargoes." He did find, however, that some steel ships had strained locally, but that this was due to oversight, where "the continuity of strength was not kept up." This is Mr. Martell's evidence, and I consider, places the matter on a very different and much more satisfactory footing. In his speech in Glasgow Mr. Martell made no reference to the 20 per cent. reduction of scantling, and I therefore took the liberty of communicating with him direct, and in reply to my question he writes to me: "No reliable evidence, to my knowledge, has been adduced showing that the 20 per cent. reduction from iron, admitted by Lloyd's Registry, was too great as a maximum." This question of the employment of a pliable material, such as mild steel, is of paramount importance to this district, for this reason—that for the production of the material now in use our local Cleveland iron is inapplicable. As you are all well aware, mild steel is produced in the Cleveland district from Cleveland ores on what is called the basic process, which complies with all Lloyd's requirements except in regard to the tensile test, which at present ranges from 23 to 32 tons, whereas the basic steel ranges from 24 to 27 tons; and though I may have appeared to question some of the

conclusions of my friend, Mr. Head, I do most cordially join in the hope that some modification of Lloyd's rules may be made to allow of the use of our local steel in vessels classed under their register. It will, at any rate, be a tested material, and this, to some extent at least, would possess, in my judgment, advantages over such iron as is commonly used in shipbuilding; and even if vessels were constructed of scantlings somewhat thicker than allowed under the present rules for steel, we should surely have structures equally reliable and trustworthy, while combining such advantages for repairs as I have endeavored to indicate above. While I write I am informed that a very careful investigation into the character of this basic steel is being conducted at this moment in the Cleveland district by Lloyd's surveyors, and the result of that inquiry will be looked for with great interest by all concerned in the shipbuilding and shipowning of the northeast coast.

Curious English Patent Specification.

Europeans have generally taken delight in pointing to the wonderful inventions which occasionally crop up among the thousands of patents granted in this country. Our English friends are not far behind us. A correspondent of the *Engineer* sends that journal the following specification, adding in his letter of transmission that "it is simply contemptible that the Commissioners of Patents should stoop to the meanness of taking the £5 which this inventor has parted with in stamps, for, as you will see, the patent for this precious invention has been completed":

"METHOD, BY BOILING AND BAKING, FOR GETTING GOLD FROM WHEAT.

"*Complete Specification*.—I, Harry Fell, of 'Fairlight,' Avenue road, South Norwood Park, in the county of Surrey, mercantile clerk, do hereby declare the nature of my invention for getting gold, by method of boiling and baking, from wheat, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:

"I cut up the whole wheat straw into little square snips the width of the straw, and mix this with an equal measure of the grains. With this mixture I measure out half a 2-quart saucepanful and set it aside. I then fill the saucepan three-quarters full of water and set it to boil over the fire, upon which I pour in the mixture and let it boil for two hours and a quarter, taking care to keep up the complement of water by adding more at intervals. At the conclusion of this boiling operation I strain off the liquor in thin layers into soup plates and allow same to rest for 38 hours—the temperature in this case being 48° F.—and then bake these slowly dry, upon which I find the gold adhering to the plates.

"Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is

"The 'method, by boiling and baking, for getting gold from wheat,' comprising the following features: The measuring out the half a 2-quart saucepanful of the mixture composed of the whole wheat straw cut into little square snips the width of the straw, mixed with an equal measure of the grains, and the setting it aside. The then filling the saucepan three quarters full of water and the setting it to boil over the fire, upon which the pouring in the mixture and the letting it boil for two and one-quarter hours; the taking care to keep up the complement of water by adding more at intervals; the allowing the thin layers of liquor in the soup plates to rest for 38 hours—the temperature in this case being 48° F.—and the then baking them slowly dry. HARRY FELL.

"Dated this 18th day of April, 1885."

Supposed Map of the Lost Atlantis.

It is stated that Mr. Meyer, a noted archaeologist, has recently made a very interesting discovery on the Island of Zapatera. Writing from Nicaragua, he says: "About 42 feet under the surface of an ancient cemetery I discovered a rock, which, judging from the figures it contains, has served in remote times for astronomical observations. On this rock I have found two stone tablets, one of which contains a representation of the world, part of Africa and Asia, united Europe and this continent. A large continent is situated in the Atlantic Ocean, which I consider the mythical lost Atlantis mentioned by some of the ancient authors. The other tablet contains inscriptions of which part is undoubtedly Phœnician."

Archibald R. Colquhoun recently addressed the London Chamber of Commerce on the desirability of extending British trade in the East, and his address has created no little interest throughout Great Britain. He says, what is contrary to the popular understanding, that England's importance has declined in regions where generations ago she was the pioneer and almost the sole occupant. He said that Germany, France and Russia were all pressing forward for places in the great centers of trade in India and China. The conditions have so changed that England can hope to maintain her trade only by offering special inducements. English authority maintains that the total trade of the 14 principal States of Europe from 1860 to 1881 brings out the significant fact that, while English trade during that period has increased 85 per cent., that of the 14 countries combined has grown 162 per cent., or nearly twice as fast as that of England. Mr. Colquhoun refers to Russia's acquisition in 1858 of the large territory of Manchuria, extending from the Amur River to the Korean frontier, which was filched from the Chinese by a trick of Ignatieff, as having left a rankling sore, which is not yet healed, and which is liable to break out on fitting provocation. He says that the only solution of the Upper Burmah trouble which will prove satisfactory is the annexation of that country by England, though it is hard for a disinterested foreigner to understand why filching by the English should be any more satisfactory than filching by Russia.

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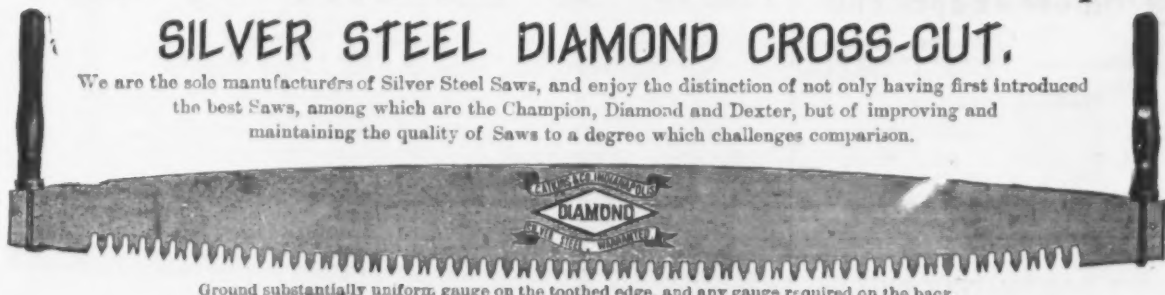
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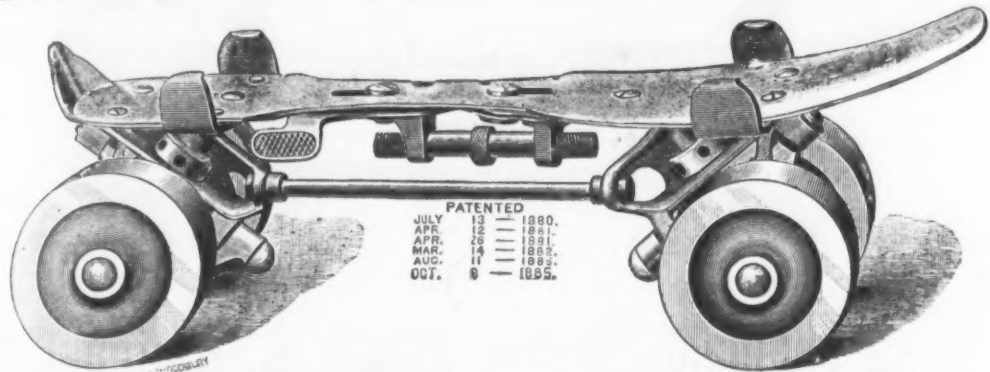
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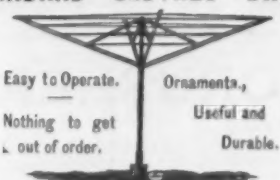
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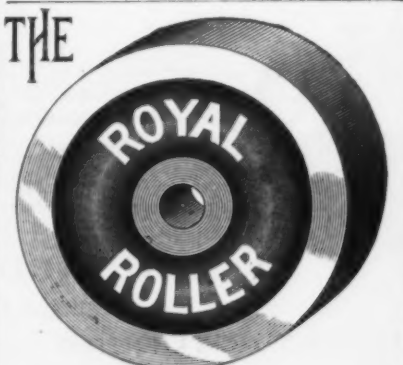
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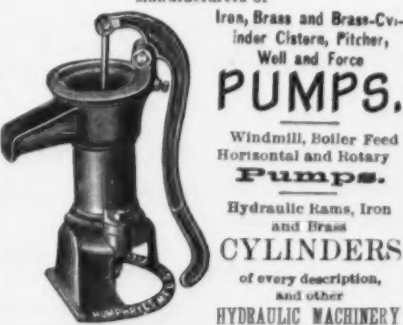
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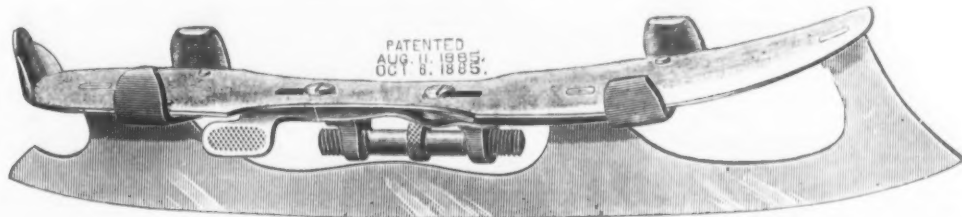
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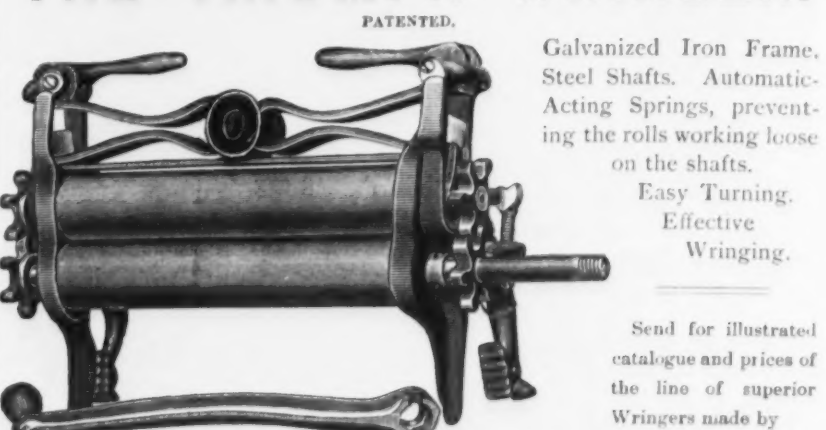
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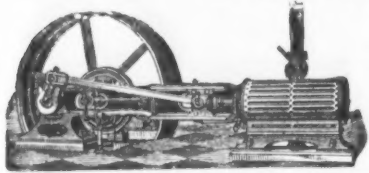
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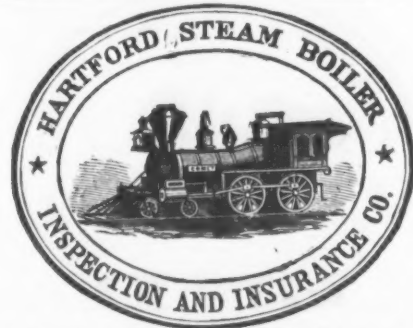


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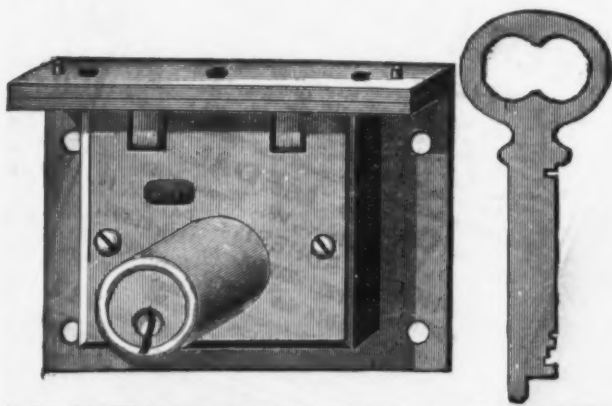
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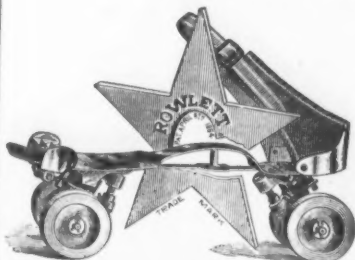
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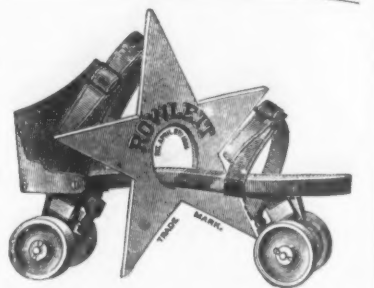
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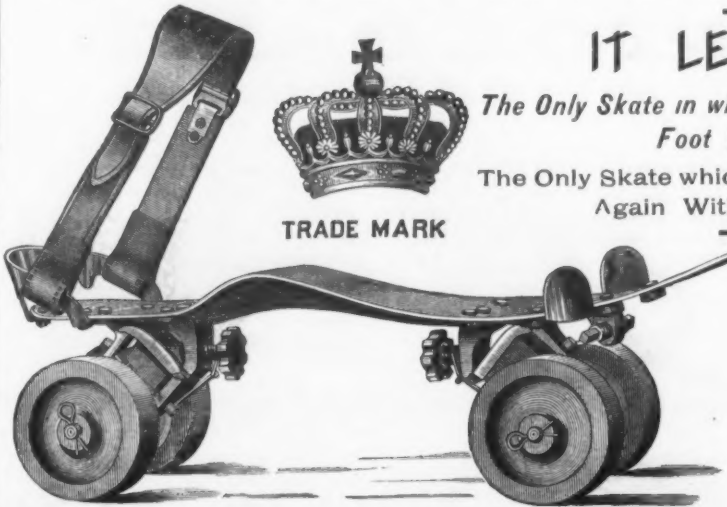


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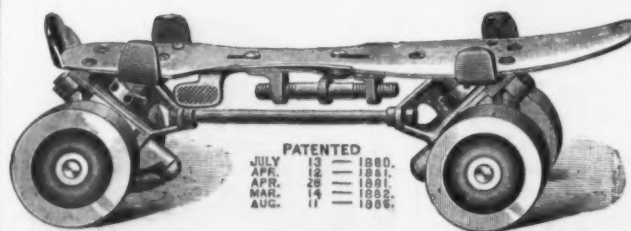
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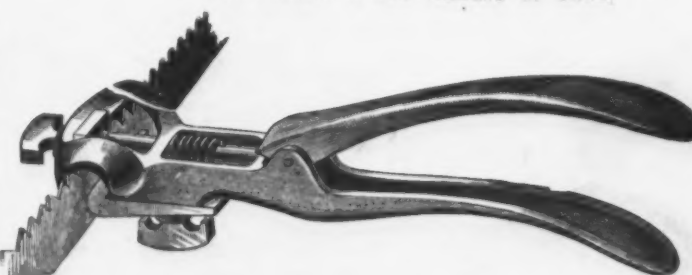
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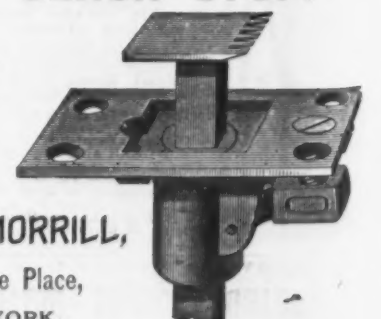
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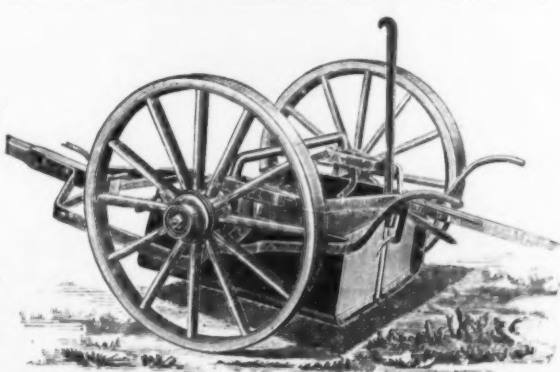
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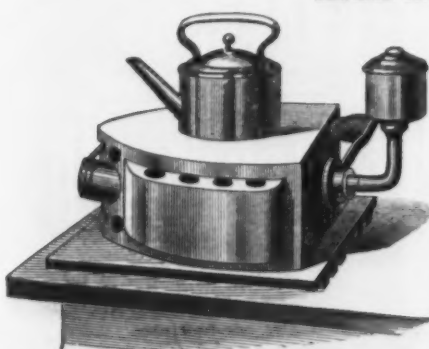
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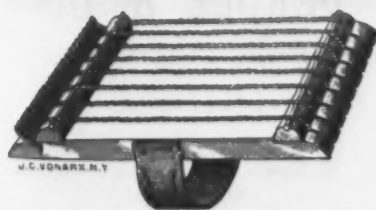


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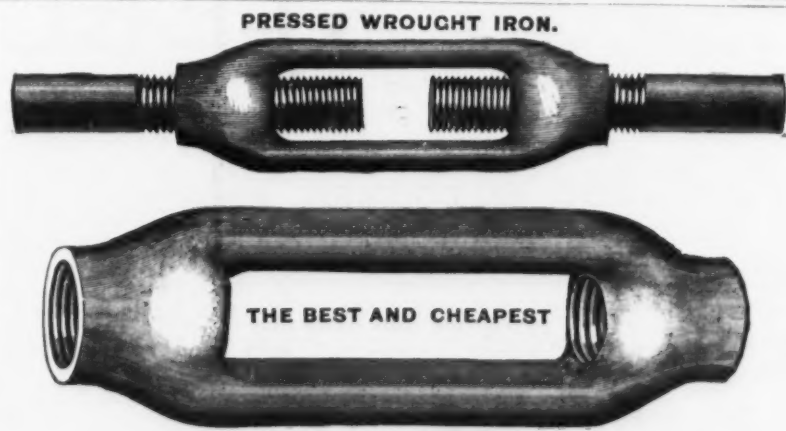
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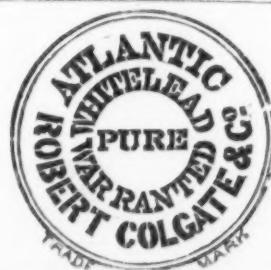
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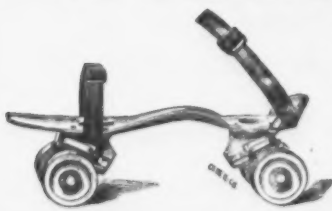
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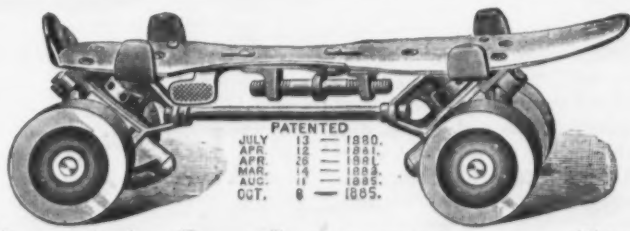
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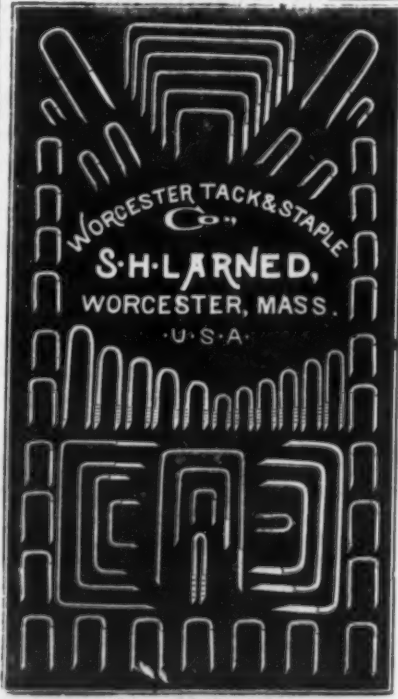
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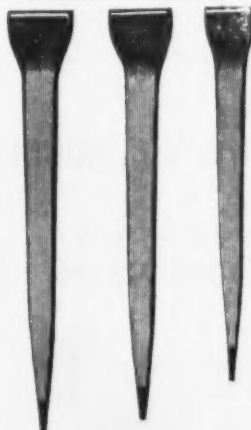
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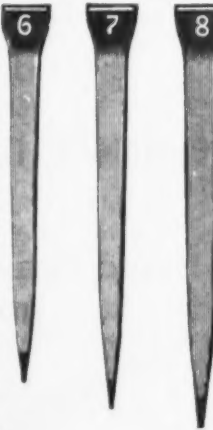
LARGE HEADS.

CHAMPION

CITY HEADS.



Horse Nails



Manufactured from very best SWEDISH METAL. Will not split. Are accurately pointed, tough, strong and hold the shoes. Soft enough to clinch readily; stiff enough to drive without bending. All nails uniform and perfect. They are used in thousands of shops with the best of satisfaction, and are especially liked by "floor-men" for their good, reliable driving.

Made in two patterns, "LARGE HEADS" and "CITY HEADS."

QUALITY GUARANTEED.

LIST:
Nos. 4 5 6 7 8 9 10
50c. 25c. 25c. 25c. 22c. 21c. 20c.

CHAMPION HORSE NAIL CO., Appleton, Wis.

LANE'S MEASURING FAUCET.

Price, \$3.00.

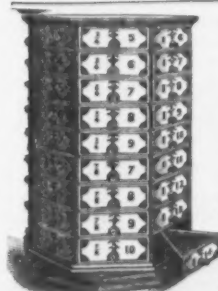
For Light or Heavy Molasses, Oils, Varnishes or other Fluids.

We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any Measuring Faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

MANUFACTURED EXCLUSIVELY BY

LANE BROS., Poughkeepsie, N. Y.

General Agency, JOHN H. GRAHAM & CO., 113 Chambers St., New York.



THE AMERICAN BOLT & SCREW CASE CO.,

DAYTON, - - - OHIO,

MANUFACTURERS OF

Patent Revolving Bolt and Screw Cases.

We are the only manufacturers of Bolt Cases and the only parties who make lists of Bolt or Screw Cases to suit stock of purchaser without extra charge.

COMBINATION BOLT AND SCREW CASES TO ORDER.

Sold by the leading Jobbing Hardware Dealers. Send for Illustrated Circular. All Cases guaranteed.



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MANUFACTURERS OF

HARDWARE SPECIALTIES,

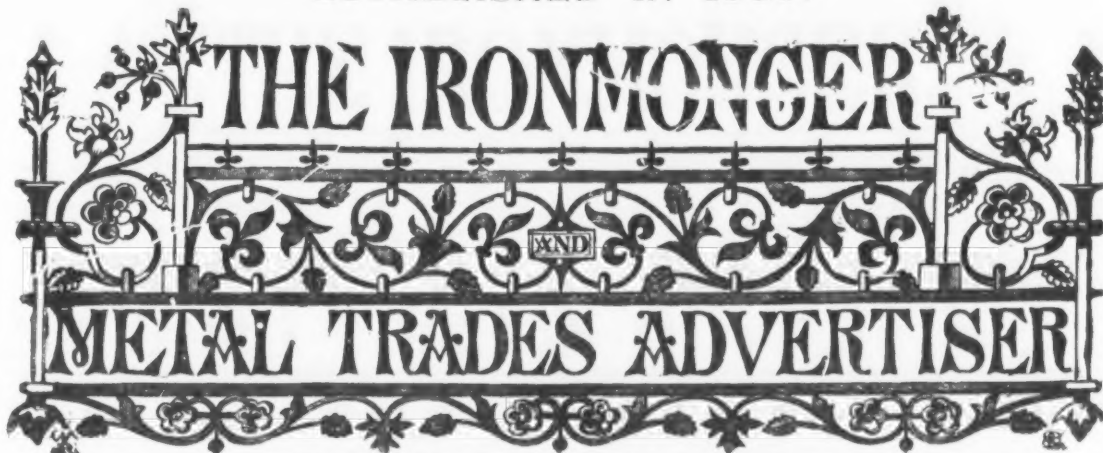
SPUN COPPER and HALF COPPER TEA KETTLES

MOULDERS' TOOLS, AWLS, COUNTER PEG FLOATS, CRIMP MACHINES, METAL SPINNING AND NICKEL PLATING.

SEND FOR CATALOGUE.

THE LONDON IRONMONGER.

ESTABLISHED IN 1859.



PUBLISHED EVERY SATURDAY.

THE OLDEST AND CHIEF REPRESENTATIVE OF THE IRON, HARDWARE AND METAL TRADES.

OFFICE: 42 CANNON STREET, LONDON, E. C.

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This is an annual, presented free to every Subscriber to the *IRONMONGER AND METAL TRADES' ADVERTISER*. It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of exceptional value for advertisements. Sold to non-subscribers at 75 cents.

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With which is incorporated The Universal Engineer.

is published every fourth week in connection with the extensive and world-wide circulation of the *Ironmonger* itself. The dates of its publication for the next twelve months will be as follows:

NOVEMBER 28, DECEMBER 26, 1885, JANUARY 23, FEBRUARY 20, MARCH 20, APRIL 17, MAY 15, JUNE 19, JULY 10, AUGUST 7, SEPTEMBER 4, OCTOBER 2, and OCTOBER 30, 1886. This supplement is published in—

FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the *Ironmonger* not only within reach, but in the native language of eighty millions of Germans, twenty-eight millions of Italians, and fifty-one millions of Spanish speaking people; or in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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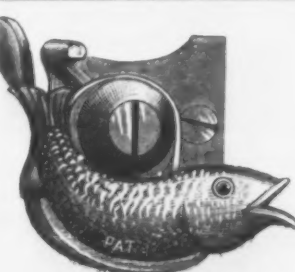
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THE WHOLE FOREIGN HARDWARE TRADE,

so far as our experience of more than twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Ironmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity, not to be compared with any of the other ordinary channels of communication.

WELDED CHROME STEEL & IRON (5 PLY) FOR SAFES VAULTS &c. CHROME STEEL WORK'S BROOKLYN, E.D.N.Y.



LIESCHE'S
Burglar-Proof Sash Lock

Automatic Window Holder.

Cheapest, Strongest and Only Practical Automatic Lock and Holder on the Market.

SAMPLES FREE TO THE TRADE.

J. R. CLANCY, Syracuse, N. Y.

JAMES HILL,

MANUFACTURER OF

GALVANIZED
BUCKETS,



AND
ASH CANS

A Specialty.

Providence R.I. P. O. Box 770.

FRUIT, WINE & JELLY PRESS
SAUSAGE STUFFER
MOLASSES SELF MEASURING FAUCET
ENTERPRISE MFG. CO.
 THIRD & DAUPHIN STS. PHILADELPHIA
Mrs. Potts' COLD HANDLE SADD IRONS
SOLD BY ALL HARDWARE DEALERS
SEND FOR ILLUSTRATED CATALOGUE
SMOKED BEEF SHAVES
MEAT CHOPPER
BUNG HOLE BORER TOBACCO & ROOT CUTTER
SELF WEIGHING CHEESE KNIFE
AWARDED FIRST PREMIUM EVERYWHERE
Nº 20 COFFEE MILL
PA. PA. PA.

PEUGEOT FRÈRES, FINEST GRADES OF STEEL

FOR WATCH, CLOCK AND OTHER SPRINGS,
 Band Steel for Saws for Metal and Wood. Steel for all Mechanical Uses. The
 "Lion" Brand of Band Saws Best and Cheapest Made.
 Correspondence Solicited.

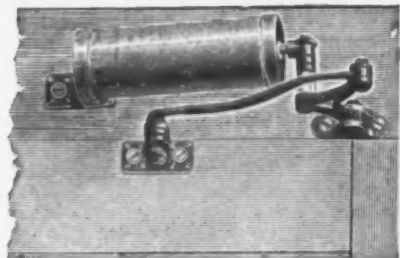
MCCOY & SANDERS,
 AGENTS FOR UNITED STATES AND CANADA
 26 WARREN STREET, NEW YORK.

D. SAUNDERS' SONS,

MANUFACTURERS OF
Pipe Cutting and Threading Machines
 For Pipe, Mill and Steam Fitters' Use.
Tapping Machines
 For Steam Fitting. Also
STEAM AND GAS FITTERS' HAND TOOLS,
 No. 25 Atherton Street,
YONKERS, N. Y.

100,000 SOLD.
 This is the only authorized INCORPORATED "E. M. Boynton Saw and File Co." in the World. Newly incorporated January 26th, 1885.
THE WONDER CROSS CUT SAW.
EM BOYNTON SAW & FILE CO.
 LATEST PATENT.
 E. M. BOYNTON, PRESIDENT.
 C. W. BOYNTON, VICE PRES.
 PATENTED NOV. 25th 1884.
 THE CUT ABOVE represents our latest patent "Wonder" Cross-Cut Saw, of which style of teeth we shall use for our Cross-Cut One-Man Pruning and Buck Saw. This tooth has all the direct fast cut of the Lightning, combined with the clearing teeth of the Champion, making it, as its name indicates, the Latest Wonder, and by actual test we decide an advantage of 20 per cent. over our former world-renowned Lightning Saw. Having newly organized January 26th, 1885, as the E. M. Boynton Saw and File Co., we shall be prepared to fill any orders for the above, as well as for goods which have been furnished our customers throughout the world for the last 14 years.
 Respectfully yours,
E. M. BOYNTON SAW AND FILE CO., 99 Chambers St., New York.

THE SHAW DOOR CHECK AND SPRING.

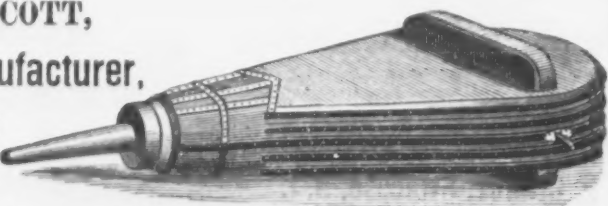


GREAT REDUCTION IN PRICE.
 The SHAW DOOR CHECK AND SPRING CO have removed to their new factory, and with their increased facilities for manufacturing their goods have decided to reduce the price of each Spring \$1 from former list, and thereby bring the machine within the reach of all. The SHAW CO. are the owners of the oldest patented device for closing doors noiselessly, and with their new improvement produce the only check and spring which the trade can sell as general hardware. The same spring can be applied to either hinge or jamb side of both right or left hand doors.

SHAW DOOR CHECK AND SPRING CO.
 MANUFACTURERS AND SOLE AGENTS.
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 BRANCH OFFICES: 77 Reade St., New York; 339 Lake St., Chicago, Ill.

GEO. M. SCOTT,
Bellows Manufacturer,

Johnson Street,
 Cor. 224 St.,
CHICAGO, ILL.



B. KREISCHER & SONS,
FIRE BRICK.
 BEST AND CHEAPEST.
 ESTABLISHED 1845.
 Office, foot of Houston Street, East River, NEW YORK.

NEWTON & CO.,
 ALBANY, N. Y.,
 MANUFACTURERS OF BEST QUALITY
FIRE BRICK
 And STOVE LININGS.

M. D. VALENTINE & BRO.,
 MANUFACTURERS OF
FIRE BRICK
 And FURNACE BLOCKS,
 DRAIN PIPE AND LAND TILE,
 Woodbridge, N. J.

BORCHNER & O'BRIEN,
 MANUFACTURERS
FIRE BRICK
 AND
 Edge Pressed Furnace Blocks,
 Clay Retorts, Tiles, &c.
 Twenty-third Street, Above Race, PHILADELPHIA.
 Twenty years' practical experience.

ESTABLISHED 1848.
TROY FIRE BRICK WORKS,
 Troy, N. Y.
James Ostrander & Son,
 MANUFACTURERS OF
FIRE BRICK,
 Tiles, Blast Furnace Blocks, &c., and in a Special
 Department Linings for Stoves, Ranges and Heaters of
 superior quality. Miners and dealers in Wood-
 bridge, N. J., Fire Clay and Fire Sand and Staten
 Island Knobs.

ESTABLISHED 1864.
JAMES GARDNER,
 Successor to GARDNER BROS.,
 MANUFACTURER OF
"STANDARD SAVAGE" FIRE BRICK,
TILE & FURNACE BLOCKS,
 OF ALL SHAPES AND SIZES
 Miner and Shipper of "Mount Savage" Fire Clay.
 WORKS, Ellerslie, Allegheny Co., Md.
 MAIN OFFICE, Cumberland, Md., P. O. Box 93.
 BRANCH OFFICE, Pittsburgh, Pa., P. O. Box 373.
 S. M. Hamilton & Co., Agents, Baltimore, Md.

UNION MINING COMPANY.
Mount Savage Fire Brick.
EDWARD J. ETTING, Agent,
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BIRMINGHAM FIRE BRICK WORKS.
 All dimensions constantly on hand. Fire
 Bricks, Fire Shapes, Kaolin, Fire
 Brick Cement, Fire Clay, Fire Sand
 for Furnaces; Coke Ovens, Stoves, Boilers, and
 for the Southern Trade generally.
STEVENS & FENTON, Propsrs.,
 Birmingham, Ala.

AIKIN & LIGHTON,
 Iron City Foundry and Machine Works,

SOLE MANUFACTURERS OF
AIKIN'S IMPROVED
"PATENTED"

SAND MOULDING MACHINE
BIRMINGHAM, ALABAMA.
 CORRESPONDENCE SOLICITED.

AMHERST THE WATER MOTOR

Parties looking for a noiseless, econom-
 ical and efficient power will do well to send
 for descriptive Catalogue, free.

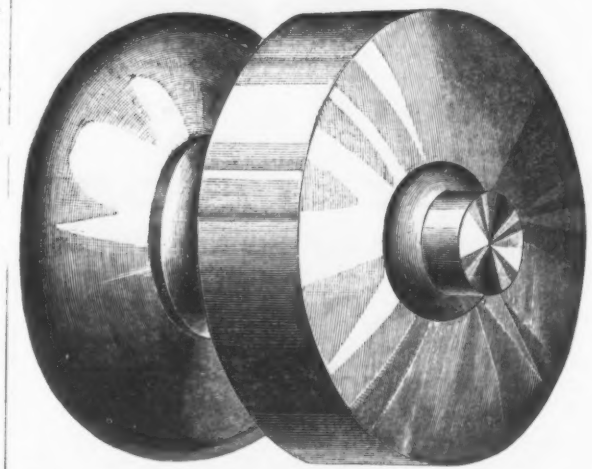
Amherst Hydraulic Motor Company,
 HOLYOKE, MASS.

Self-Binders for The Iron Age.



We are now prepared to supply our sub-
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 their papers, a cut of which is annexed.
 We call attention to the low prices at which
 it is offered. Address all orders to
DAVID WILLIAMS,
 55 Reade Street, New York.

New England Butt Co.



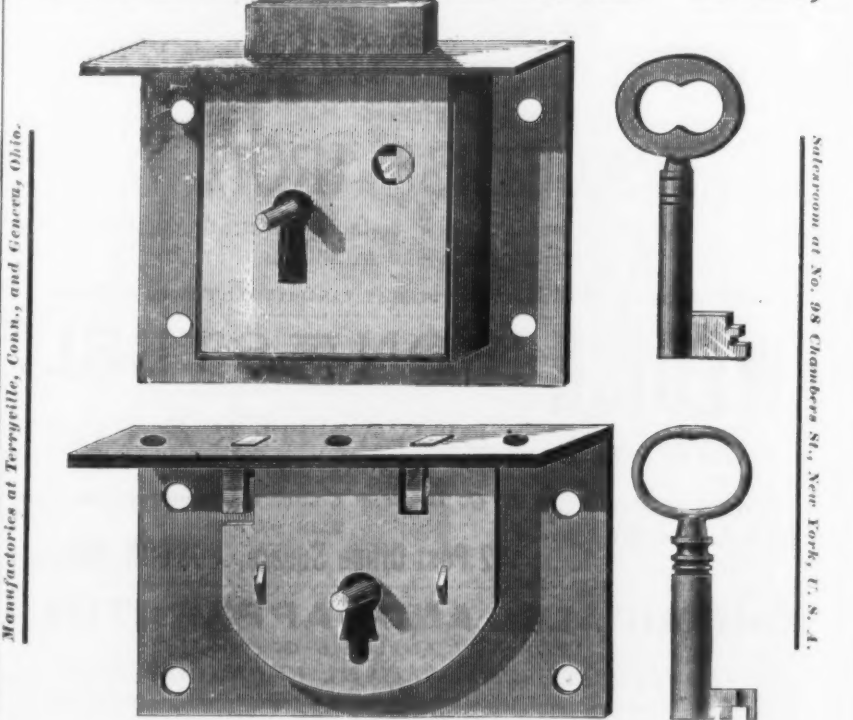
PROUTY'S PATENT
 RIGID
 Door Knobs
 AND
 Locks
 AND OTHER

Builders' Hardware,

Catalogue Sent Free on Application.

Providence, R. I., U. S. A.

EAGLE LOCK CO.,



MANUFACTURERS OF THE LARGEST VARIETY OF
Cabinet, Trunk and Pad Locks
 MADE BY ANY ONE CONCERN IN THE WORLD.
 Illustrated Catalogue Mailed to the Trade Free upon Application.
 Orders for special Die and Press Work and Small Brass Castings solicited at our Terryville Works.

P. LOWENTRAUT,
 MANUFACTURER OF
MECHANICS' TOOLS, GENERAL HARDWARE, HOUSE
FURNISHING GOODS,
 36 to 64 Kent, Corner Brenner St., Newark, N. J.
"EUREKA" CLUB SKATES.



SIZES, 8, 8½, 9, 9½, 10, 10½, 11, 11½, 12 Inches.
 This Skate is simple in its construction, and has many advantages over other Skates. The new
 principle of operating the clamps gives great strength to the clamping of the heel. The pressure bar
 in front of the heel has a curved form which braces the instep of boot or shoe, and prevents the
 turning of the foot while skating. The plates are of welded steel, carefully tempered and hardened.
 The superior care in tempering and workmanship gives the "Eureka" advantages that no other
 Skate has.

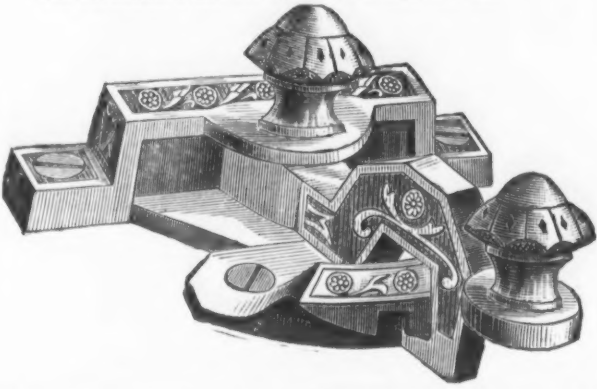
WHITE MOUNTAIN FREEZER CO.,

MANUFACTURERS OF
 Sands' Patent Triple Motion
WHITE MOUNTAIN ICE CREAM FREEZER.
 The only Freezer ever made having three distinct motions,
 thereby producing finer, smoother Cream than any other Freezer
 on the market. Acknowledged by every one to be the best in
 the world. Over 300,000 in use to-day. Outside Irons Galvan-
 ized, but all inside the can coated with Pure Black Tin. Tubs
 water-proof; easily adjusted and operated. We also carry
 large stock of Packing Tubs, Packing Cans, Ice Crushers, &c.
 Send for Price List and Trade Discounts. Address

WHITE MOUNTAIN FREEZER CO.,
 101 E. Hollis St., Nashua, N. H.

For Net Bottom Prices see Page Adv. Iron Age, Nov. 5th.

BROUGHTON'S
BURGLAR-PROOF SASH LOCKS.
(Patented Oct. 27th, 1879.)
FOR NET BOTTOM PRICES SEE PAGE AD.
IN IRON AGE, Nov. 5th.



No. 210, Ornamental Iron, Iron Knob, fine finish, Etirusean Bronze.....	\$0.60
No. 211, Ornamental Iron, Iron Knob, fine finish, Olympian Bronze.....	.75
No. 212, Ornamental Iron, Iron Knob, fine finish, Pompeii Bronze.....	.85
No. 213, Ornamental Iron, Iron Knob, Nickel-plated.....	1.25
No. 214, Ornamental Iron, Iron Knob, Nickel-plated, Rich Old Gold Inlaid.....	1.50
No. 215, Ornamental Iron, Iron Knob, Nickel-plated, Pale Old Gold Inlaid.....	1.60
No. 216, Ornamental Iron, Iron Knob, Nickel-plated, Fire Old Gold Inlaid.....	1.75
No. 21, Ornamental Iron, Iron Knob, Nickel-plated, Crimson Old Gold Inlaid.....	1.85
No. 218, Ornamental Iron, Iron Knob, Nickel-plated, Blue Old Gold Inlaid.....	2.00
No. 219, Ornamental Iron, Iron Knob, Nickel-plated, Green Old Gold Inlaid.....	1.95
No. 220, Ornamental Iron, Iron Knob, Nickel-plated, Copper Old Gold Inlaid.....	2.00
No. 221, Ornamental Iron, Iron Knob, Nickel-plated, Lemon Oil Gold Inlaid.....	2.05
No. 222, Ornamental Cast Brass, Polished and Lacquered.....	2.65
No. 223, Ornamental Cast Brass, Nickel-plated.....	3.00

MANHATTAN HARDWARE CO.,

READING, PA., U. S. A.,
MANUFACTURERS OF
LOCKS OF Every Description,
AND A FULL LINE OF
GENERAL BUILDERS' HARDWARE.

Special net prices to be found in *Iron Age* whenever changes occur.
The only manufacturers in the United States who quote bottom prices to all dealers without favoring any class.
Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order at very low prices; Pattern Making, Japanning, Bronzing, Tinning, &c.
Our goods are known and liked wherever sold.
Orders received will be filled at last prices quoted in *The Iron Age*.
We do no underhand business, but quote alike to all for quantities less than \$1000.
Our terms are strictly 15 days, f. o. b. Reading, no charge for cases or cartage.

UNION BRIDGE COMPANY.



Charles Kellogg, Thos. C. Clarke, C. S. Maurice, Geo. S. Field, Edmund Hayes, C. Macdonald.
CIVIL ENGINEERS
And Constructors of Iron and Steel Bridges, Viaducts, Roofs, Elevated Railroads, Marine Piers, Etc.

Works: Athens, Pa. Works: Buffalo, N. Y.
Late Kellogg & Maurice. Capacity, 14,000 tons. (Late Central Bridge Works.) Capacity, 12,000 tons.
DESIGNS AND ESTIMATES WILL BE SENT ON APPLICATION TO

UNION BRIDGE COMPANY, 18 Broadway, New York.
THE HARRINGTON & KING PERFORATING CO.,
Main Office and Works, Nos. 224 and 226 N. Union St., Chicago.



PERFORATED SHEET METALS

FOR ALL KINDS OF GRINDING MACHINERY in any size and for all uses.
REVOLVING SCREENS of every description made to order. STAMP BATTERY SCREENS a Specialty.

PERFORATED TIN & BRASS
Of All Sizes for FILTERS, STRAINERS, VENTILATORS, &c., &c.
Iron, Steel, Copper, Brass and Zinc Punched to any size and thickness required.
Branch Office, 100 Beckman St., New York.

Steel Door Hangers

FOR EVERY PURPOSE.



Anti-friction Steel Barn Door Hangers.
Three sizes of Steel Common Hangers.
Anti-friction Steel House Door Hangers.
Heavy and Extra Heavy Anti-friction Hangers for Warehouses, Freight Depots, &c.
Anti-friction Steel Elevator Hangers for Iron or Wooden Doors.
Special shapes and sizes of Hangers made to order.
All Hangers made for either Iron or Wood Track.
Wrought-Iron, Lock-Joint, Round-Edge Hanger Track in any desired lengths and sizes.
Track Brackets, Stay Rollers, Combination Latches, Automatic Gate Hinges.
The most complete and finest line of these goods manufactured.
Prices the lowest. Catalogues and Lists on application.

SCRANTON MFG. CO., 68 to 74 W. Monroe St., Chicago.

BRAINERD & CO., Eastern Agents, 97 Chambers St., New York.

THE BEST IS THE CHEAPEST.

THE BRUSH-SWAN ELECTRIC LIGHT CO.,

W. L. STRONG, President. A. D. JULLIARD, Vice-President. C. P. WHITNEY, Secretary.
R. W. ABORN, Treasurer. JOHN B. POWELL, Gen'l Manager.

REMOVED TO Nos. 204, 206, 208, 210 Elizabeth Street, New York.

Where Electric Apparatus for all the various modes of lighting and transmitting of Power are in operation.
No other system is as economical in installation and maintenance. No other Electric Light is as durable. Our first machines made are still in daily operation.

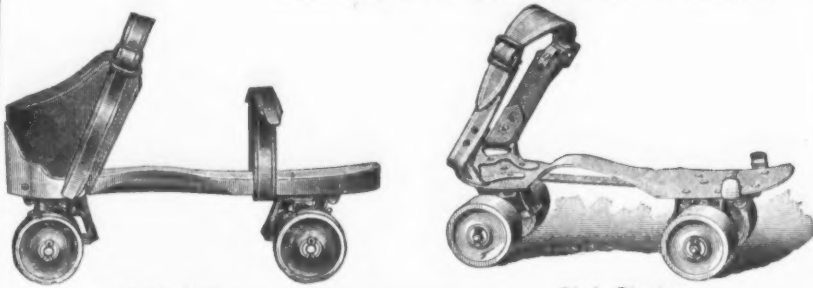
The System Comprises

Arc Lights of various sizes.
Arc and Incandescent Lights from one Dynamo and Circuit.
Incandescent Lights of various sizes from special Dynamo for Central Station Lighting.
Cost of Apparatus greatly reduced. Surveys and Estimates by experts.

Eureka Roller Skate.

SOMETHING NEW.

Ball Bearing and Ratchet Movement.
Most Easy for Beginners. Best for Experts.



MANUFACTURED BY
EUREKA SKATE CO., Richmond, Ind.
Send for Catalogue.

ROOT'S HANDY CLOTH-BOUND HARDWARE PRICE CARDS.

For Either Wholesale or Retail Trade.

COPYRIGHTED 1885.

These Cards have only been in print one month and have already reached a Second Edition on several numbers. They cover the lines having a large variety of sizes or numbers avoid marking each package or article, in Retail Stores, and are very convenient for use in Wholesale Sample Rooms. They secure correct and uniform selling prices, save time, and no Hardware Dealer can afford to do without them. They are printed in very distinct type, on the best Ledger Paper, appropriately ruled with blue ink cross lines and red ink down rulings, for noting in pencil—List, Cost, Jobbing and Selling Prices. They are mounted on both sides of a tough, heavy card-board, especially adapted for this use, which is further protected on the four edges by being cloth-bound. Two-thirds of them are 3 x 13 1/2 inches. This size has been found convenient for hanging on any narrow surface, without hiding the goods. In the top of each Card a nickel-plated eyelet is firmly inserted.

PRICES IN SETS.

Set No. 1. Includes all the numbers, 1 to 32 inclusive.....	Price, \$10.00 per Set.
Set No. 2. Onits Cards Nos. 25, 26, 27, and includes all the other numbers described above.....	8.00
Set No. 3. For Dealers in Tinware and House Furnishing Goods, consists of Cards Nos. 25, 26, 27.....	2.00
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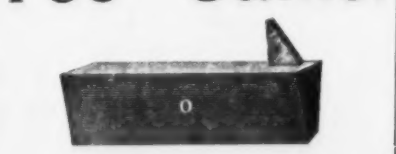
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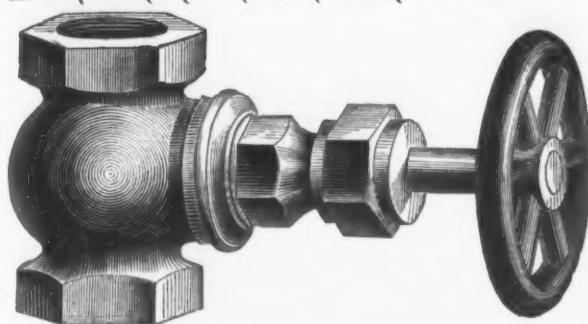
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Silver Glass Bell Pulls.....	dis 50 s
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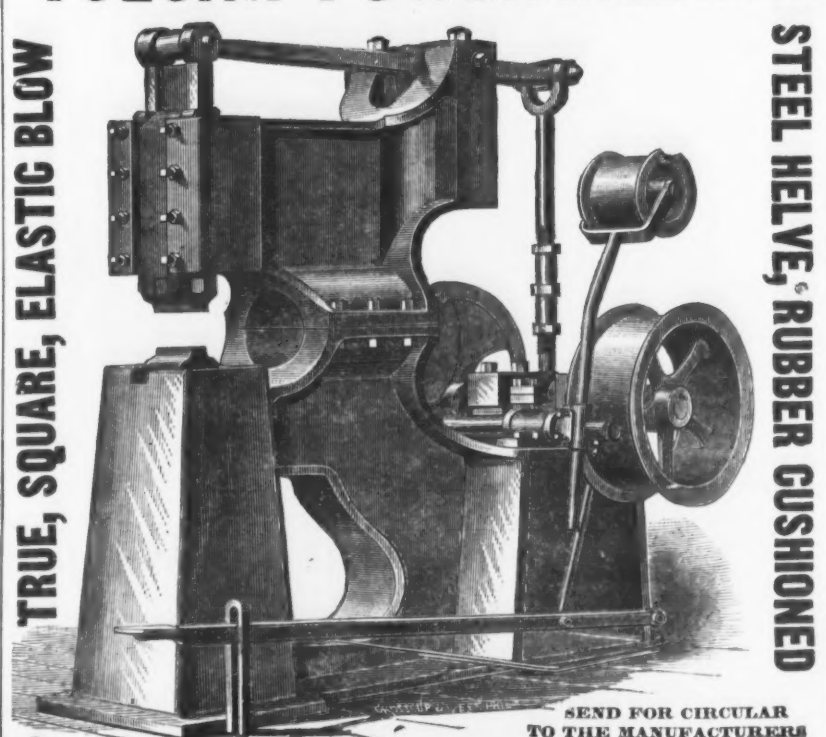
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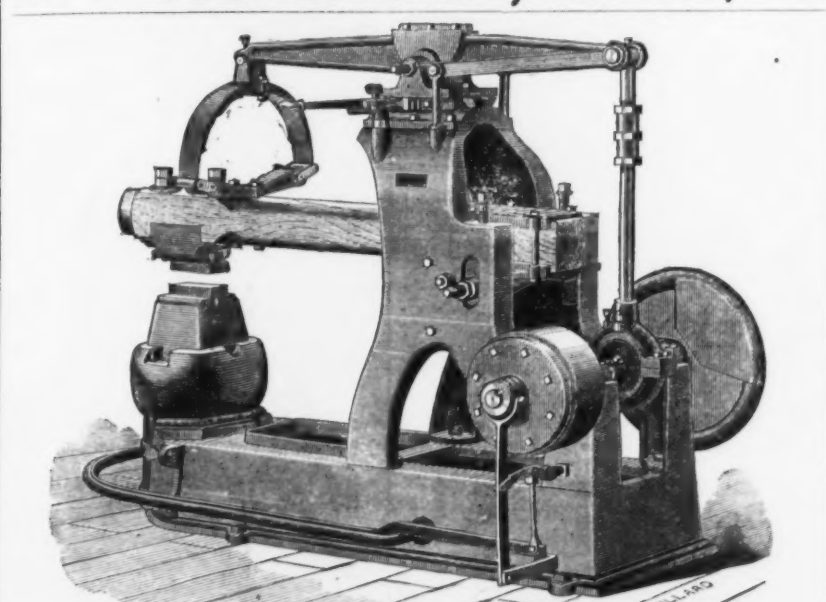
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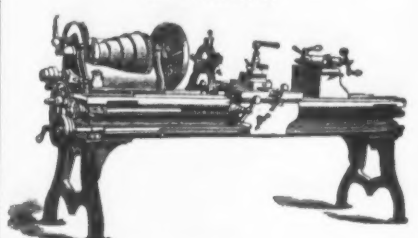
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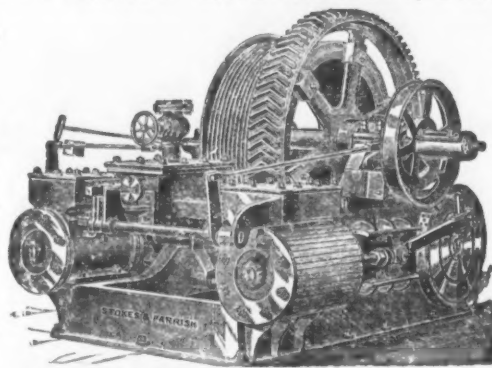
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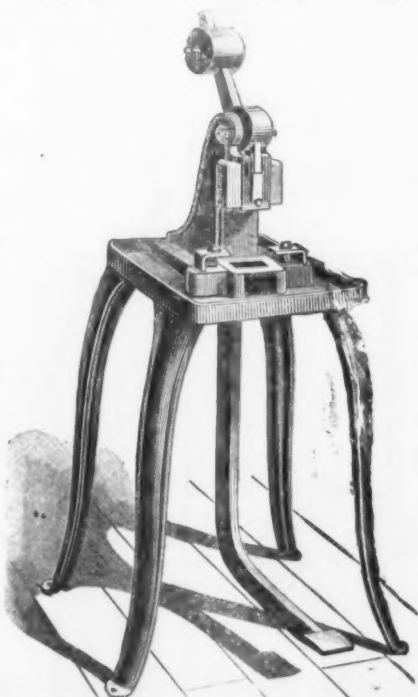
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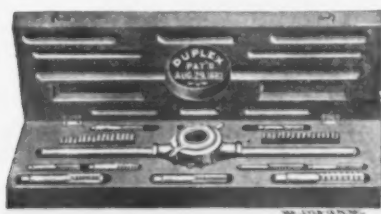
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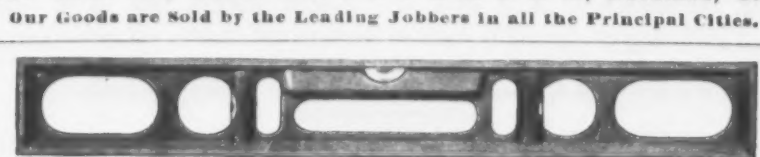
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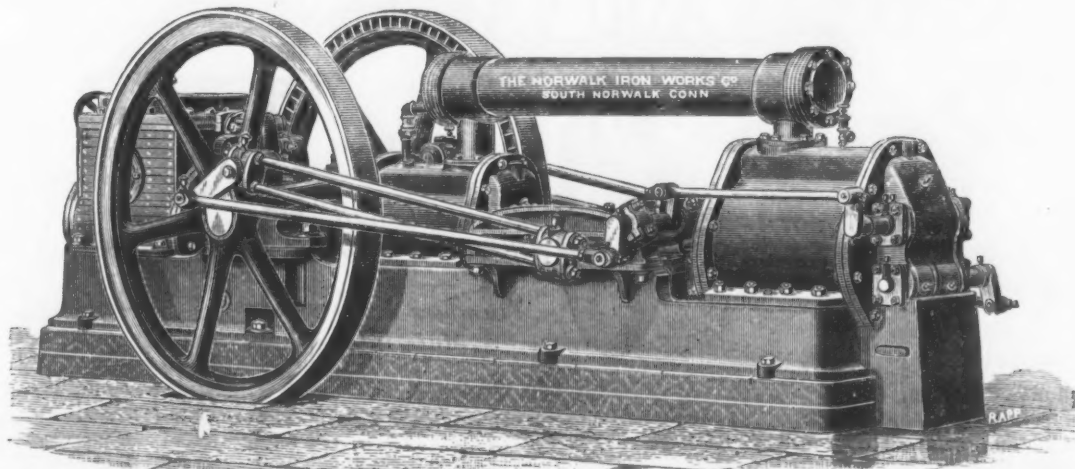
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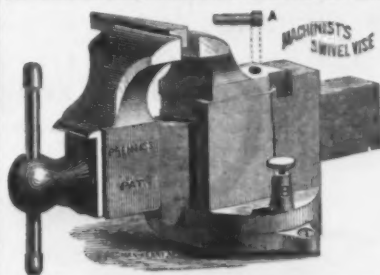
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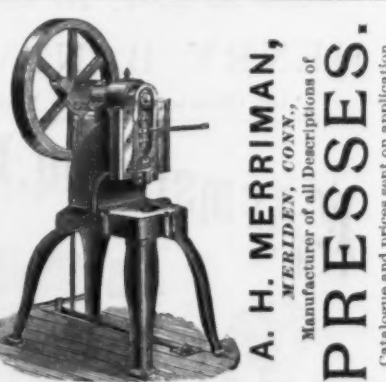
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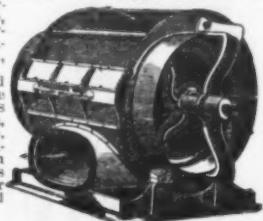
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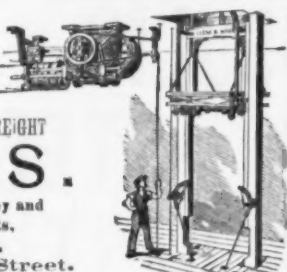
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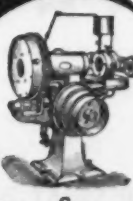
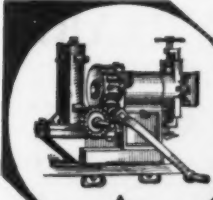
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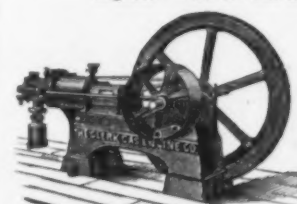
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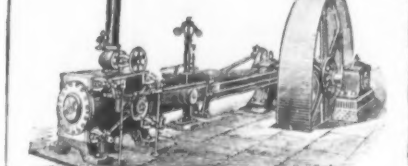
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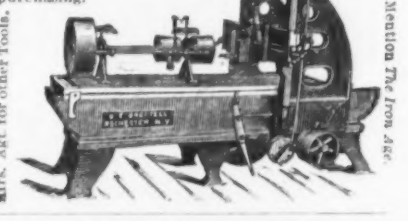
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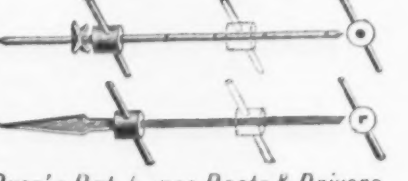


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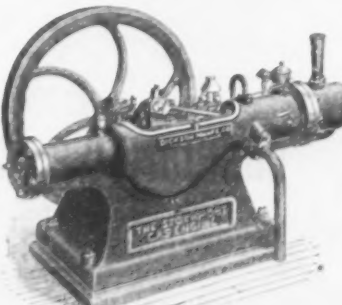
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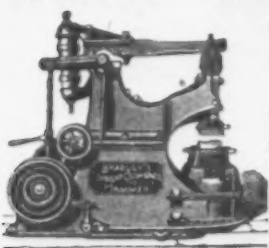
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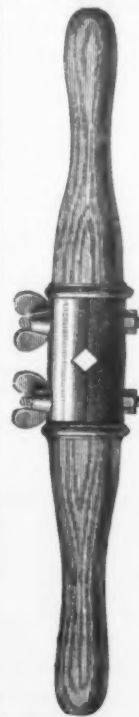
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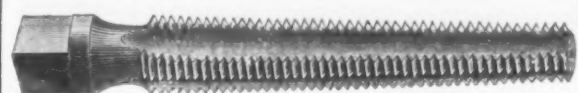
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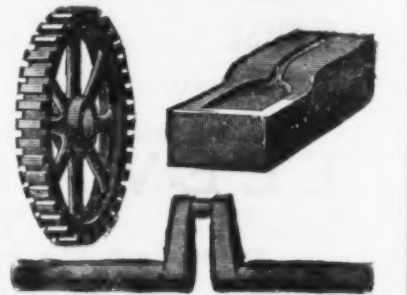


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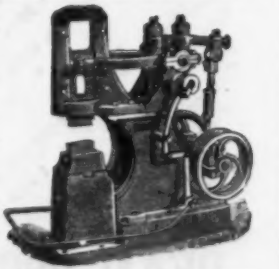
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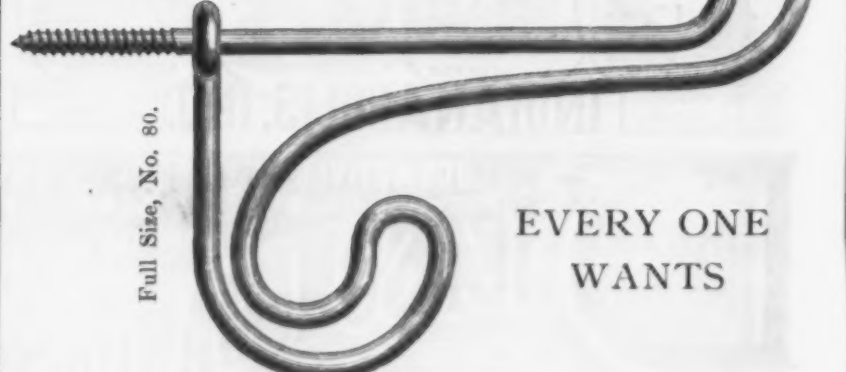
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